TERTIARY MUSIC STUDENTS' EXPERIENCES OF AN OCCUPATIONAL HEALTH COURSE INCORPORATING THE BODY MAPPING APPROACH

Bridget Louise Salonen

A thesis submitted in accordance with the requirements for the degree PhD (Music)
in the Faculty of Humanities, Odeion School of Music
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Supervisor: Dr Frelét de Villiers
Co-supervisor: Prof Judy Palac

DEDICATION

To the musicians whose healing paths I have been a part of:

You are heard.

You and your music do matter.

Your courage and your love for music inspire mine.

PROOF OF
LANGUAGE EDITING

8 July 2018

I, Wendy Stone (ID 7806270156089), hereby declare that I am a qualified language practitioner and that I have proofread and edited the doctoral thesis *Tertiary music students' experiences of an occupational health course incorporating the body mapping approach* by Bridget Louise Salonen.

Please contact me should there be any queries.

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Dr Wendy Stone
PhD; HED

DECLARATION

I declare that the thesis hereby submitted for the qualification PhD (Music) at the University of the Free State is my own independent work and that I have not previously submitted the same work for a qualification at/in another University/faculty.

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Bridget Salonen

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ABSTRACT

The high prevalence of performance-related health problems (PRHPs) among musicians of diverse genres and cultures is well-documented, with lifetime prevalence rates showing that roughly 75% of musicians are affected, including tertiary and pre-tertiary student musicians, professionals and amateurs. Despite the well-established and multiple benefits of music for society, there are occupational risks, both neuromusculoskeletal and psychological.

The literature underscores the need for a biopsychosocial perspective in the provision of musicians' health education. Research on somatic educational practices demonstrates their suitability for addressing the postural, movement, musculoskeletal anatomy and proprioceptive training components. One of these practices, Body Mapping (BMg), focuses particularly on musicians' needs and may be successfully incorporated into a musician's health course. However, BMg is a relative newcomer among the established somatic approaches and little research has been done on the incorporation of BMg principles into music education.

Due to the limited amount of research on the implementation and assessment of health education in tertiary musicians' training, the purpose of this study is to focus on exploring the experiences of tertiary music students participating in an occupational health course, incorporating BMg as the somatic component. Interpretative Phenomenological Analysis was chosen for the thematic analysis of the interviews conducted. The aims of the study were to gain an understanding of the participants' experiences and perceptions of the course, any changes that occurred, and of BMg as the somatic education component. The data analysis revealed four super-ordinate themes: panorama, physical awareness, psychological awareness and musicianship, supported by a total of 20 subordinate themes.

Most importantly, the findings emphasise the reciprocal interactions of physiological, psychological, behavioural and musical aspects of music-making, and suggest that

BMg may be highly effective in terms of the integrated teaching of musicians' biopsychosocial and artistic requirements. The study underscores the need for musicians' health education to be embedded in tertiary musicians' training, the beneficial impacts of comprehensive musicians' occupational health education, and the value of BMg as a somatic education component. The results provide information on essential course content, the advantages of interdisciplinary collaboration, the need for practical activities, the optimal duration, the value of peer learning and support, the importance of cooperation with music teachers, and the consideration of students' motivation to attend and their readiness for change. The study also aims to raise awareness of the musicians' health field in South Africa, and the critical need for further research, interdisciplinary collaboration, and the implementation of musicians' occupational health education at tertiary institutions.

Keywords/Terms: performing arts health, performance-related musculoskeletal disorders, musicians' occupational health, music performance, music education, performance psychology, Body Mapping, somatic education, Interpretative Phenomenological Analysis, musicians' health promotion

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LIST OF ACRONYMS

AT	Alexander Technique
BAPAM	British Association for Performing Arts Medicine
BMg	Body Mapping for musicians
BT	Botulinum toxin
CBT	Cognitive behavioural therapy
CCI	Cultural and Creative Industries
CCMC	Cranio-cervico-mandibular complex
CMD	Craniomandibular dysfunction
CTD	Cumulative trauma disorder
ED	Embouchure dystonia
EMG	Electromyography
FD	Focal dystonia
FM	Feldenkrais Method

GERD	Gastroesophageal reflux disease
HPSM	Health Promotion in Schools of Music
ICSOM	International Conference of Symphony Orchestra Musicians
IPA	Interpretative Phenomenological Analysis
ISME	International Society for Music Education
LPR	Laryngopharyngeal reflux
MHNCI	Musicians' Health National Curriculum Initiative
MIDI	Musical instrument digital interface
MRI	Magnetic resonance imaging
MSA	Multidimensional signal analysis
MSI	Musculoskeletal injury
MSP	Musculoskeletal pain
NASM	National Association of Schools of Music
NIHL	Noise-induced hearing loss
NIOSH	National Institute for Occupational Safety and Health
NOMC	New Orleans Music Clinic
PRHP	Performance-related health problem
PRMD	Performance-related musculoskeletal disorder
ROM	Range of movement
RSI	Repetitive strain injury
RPE	Rate of perceived exertion
SA	South Africa
SAS	Student Advocate Scheme
SDE	Slow-down exercise
SIG	Special interest group
SIMS	Services Invested in Musician Support
TB	Tuberculosis
TWA	Time-weighted average
UNT	University of North Texas
UK	United Kingdom
USA	United States of America
VPI	Velopharyngeal insufficiency

CHAPTER 1
INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

This chapter provides the context, purpose and 'roadmap' of the study: "Tertiary music students' experiences of an occupational health course incorporating the Body Mapping approach." I will begin with an explanation of my path into the field of musician's health and wellbeing, and expand on musicians' occupational health, health education for musicians and the somatic educational practice designed for musicians, namely Body Mapping. The research questions will also be presented followed by a brief synopsis of the qualitative phenomenological research design. A short discussion of the study's significance is followed by a concluding outline of the various chapters.

1.2 BACKGROUND AND RATIONALE

As both a professional performing musician (solo, ensemble and orchestral) and music educator (primary, secondary, tertiary and adult teaching), I became interested in musicians' health in the early part of my career. I saw many orchestral colleagues and university students with performance-related health problems (PRHPs) and sometimes found long rehearsals, personal practice and performances physically draining and arduous. I noticed the pervasive lack of musicians' health awareness, the chronic nature of many of the PRHPs, the lack of preventative strategies and the challenges that musicians faced in obtaining correct diagnosis and appropriate treatment. I took lessons in the Alexander Technique and later trained in Body Mapping after which I became qualified as a Licenced Andover Educator.[1] My initial research included somatic education approaches and the integration thereof into

[1] Andover Educators is the training, licensing and professional association for Body Mapping teachers.

instrumental and vocal pedagogy, followed by further research into musicians' occupational health and prevention interventions.

Despite the proven and multiple benefits of music for society, there are occupational risks of a neuromusculoskeletal and psychological nature (Wijsman & Ackermann 2018; Chan, Driscoll & Ackermann 2014; Brandfonbrener 2010; Wu 2007). There is a substantial body of literature reporting unacceptably high rates of PRHPs among performing musicians, with prevalence figures ranging from roughly 40% to 90%.[2] Musicians of diverse genres and cultures are affected (Devroop 2016; Kenny & Asher 2016; Mishra, De, Gangopadhyay & Chandra 2013; Mehrparvar, Mostaghaci & Gerami 2012; Raeburn, Hipple, Delaney & Chesky 2003).

The early ground-breaking survey study on 48 orchestras by Fishbein, Middlestadt, Ottati, Strauss and Ellis in 1988 found that 76% of the musicians had at least one problem, which was sufficiently severe to interfere with performance and that 36% had four of these problems. Recent research confirms the high prevalence rates of health problems among professional musicians (Steinmetz, Scheffer, Esmer, Delank & Peroz 2015; Kenny, Driscoll, & Ackermann 2014; Ackermann, Driscoll & Kenny 2012). College students were found to have similar rates of PRHPs to professional musicians (Spahn, Nusseck & Zander 2014; Zander, Voltmer & Spahn 2010; Brandfonbrener 2009; Spahn, Hildebrandt & Seidenglanz 2001; Zaza 1998).

Preventative strategies, including education, are therefore imperative (Wijsman & Ackermann 2018; Panebianco-Warrens, Fletcher & Kreutz 2015; Silva, Lã, & Afreixo 2015). Yet minimal attention has been given to research in the area of preventative coursework, both in terms of efficacy and course content. The few studies on health promotion programmes at conservatories found that the programmes were beneficial

[2] Kok, Huisstede, Voorn, Schoones and Nelissen (2016); Guptill (2011b); Leaver, Harris and Palmer (2011); Cebriá I Iranzo, Pérez Soriano, Igual Camacho, Llana Belloch and Cortell Tormo (2010); Dommerholt (2009); Guptill (2008); Abreu-Ramos and Micheo (2007); Wu (2007); Foxman and Burgel (2006); Davies and Mangion (2002); Harper (2002).

and provide evidence supporting their implementation (Laursen & Chesky 2014; López & Martínez 2013; Barton & Feinberg 2008; Spahn, Hildebrandt & Seidenglanz 2001). There is a clear need for comprehensive health literacy training embedded in tertiary music education (Wijsman & Ackermann 2018; Rickert, Barrett & Ackermann 2015; Voltmer, Zander, Fischer, Kudielka, Richter & Spahn 2012; Guptill 2011; Hoppmann 2010; Britsch 2005).

Significant recommendations acknowledging the health needs of tertiary music students have emerged in the USA. The Health Promotion in Schools of Music Project (HPSM) published guidelines for tertiary level music institutions, recommending prevention education and intervention as the primary approach, including occupational health courses (Chesky, Dawson & Manchester 2006). These proposals eventually led to the mandatory health policy accreditation standard set by the National Association of Schools of Music (NASM). The NASM Handbook 2012-13 states that "Music program policies, protocols, and operations must reflect attention to maintenance of health and injury prevention" (NASM 2013:67).

The majority of PRHPs among musicians are musculoskeletal.[3] In addition to the important psychological components, essential considerations for preventative interventions therefore relate to movement anatomy, efficient biomechanics, postural training, movement and body awareness work, and ergonomics. These aspects are all consistently recommended as integral components of musicians' occupational health coursework (Rickert, Barrett & Ackermann 2015; López & Martínez 2013; Kava, Larson, Stiller, & Maher 2010; Kreutz, Ginsborg & Williamon 2008b; Foxman & Burgel 2006). These body-related or somatic constituents are imperative because the quality of musicians' movements determines not only physical efficacy related to aspects, such as tension, efficiency and posture[4], but also to artistic efficacy in terms of the

[3] Ackermann, Kenny, O'Brien and Driscoll (2014); Charnock, Hicks and Hayhurst (2014); Edling and Fjellman-Wiklund (2009); Schuele and Lederman (2004); Zuskin et al. (2004); Lederman (2003); Rosset-Llobet et al. (2000); Fishbein et al. (1988).

[4] The variable understandings and therefore implications of the term posture are explained on pages 147-148.

quality of musical sounds produced. Yet proprioceptive awareness is rarely taught and frequently musicians suffer injuries as a result of the repetitive requirements (Buchanan & Hays 2014; Guptill 2011; Woodard 2009; Rardin 2007; Palac & Grimshaw 2006; Schlinger 2006; Conable 2003; Slade, Mahoney, Dailinger & Baxamusa, 1999).

Body Mapping (BMg)[5], a somatic method which focuses on musicians' needs, may offer a solution to the musculoskeletal anatomy, movement and proprioceptive training requirements of a health education intervention. Barbara Conable (2000:5) defines BMg as "the conscious correction and refining of one's body map to produce efficient, graceful, and coordinated movement". BMg applies relevant musculoskeletal anatomy to musical performance and trains kinaesthetic sensitivity, aiming to facilitate physically integrated and emotionally connected expression (Buchanan & Hays 2014; Johnson 2009; Malde, Allen & Zeller 2009; Vining 2008; Barrett 2006; Likar 2005; Nesmith 2001). The pioneering qualitative BMg study by Heather Buchanan (2011) investigated student perceptions of their performance and development after participating in a BMg course. Her study confirmed the efficacy of BMg for the participants.

It is clear that musicians' health promotion and injury prevention education at tertiary level is essential. Yet in South Africa, musicians' occupational health education within the curricula of musicians' tertiary training does not exist (Panebianco-Warrens, Fletcher & Kreutz 2015). Underpinning this issue is a general lack of musicians' occupational health awareness, although some advocacy is starting to emerge (Devroop 2014).

Impactful research on the health and well-being of musicians is therefore critical in order to broaden awareness, stimulate interest, build capacity in music education and

[5] The Body Mapping abbreviation 'BMg' has been chosen for use in this thesis because the abbreviation BM is already utilised for several other medical terms. Please note that there is currently no standardised Body Mapping abbreviation stipulated.

performance, create interdisciplinary synergies and facilitate evidence-based knowledge exchange. These aspects will facilitate the development of supportive, integrated and coordinated approaches for musicians' health in both the educational and professional sectors.

In higher music education, the implementation of effective health and well-being interventions is necessary. Research that investigates the content, implementation and efficacy of preventative musicians' occupational health coursework at tertiary level is imperative. This is vital, particularly in the South African context, where it has not been done before.

Additionally, research on incorporating BMg principles into tertiary musicians' health education is required. The application of BMg as the somatic educational component of a comprehensive health intervention will be studied for the first time. BMg was developed specifically for musicians, yet there is only one prior study on it being included in tertiary musicians' training. BMg, a relatively new somatic practice, may have the potential to improve musical performance outcomes, help prevent PRHPs and enhance well-being in musicians.

1.3 RESEARCH AIMS AND OBJECTIVES

The purpose of the study is to explore student musicians' experiences of an occupational health course incorporating the BMg approach, focusing on the subjective experiences of the course participants. The aims are to gain insight into what the course was like for them, their perceptions of any changes that may have occurred, their experiences of BMg as the somatic component of the course and their experience of musicians' health coursework as the first of its kind in the local context.

Furthermore, the research aims to explore the students' experiences, perceptions and understandings of their biopsychosocial well-being and musicianship with regard to the physical-mental-artistic connections of music preparation and performance, and

how physical and psychological awareness are connected to the musical aspects and injury prevention.

The course includes material from “What Every Musician Needs to Know about the Body”, the six-module BMg course taught by Andover Educators in which the students are taught relevant musculoskeletal movement anatomy and proprioceptive skills. Other topics that are included in the course are risk factors, injury prevention, performance psychology, practising strategies, the Alexander Technique and hearing conservation.

1.4 RESEARCH QUESTIONS

The formulation of the main research question was guided by the overall purpose of the study, which is to explore student musicians’ experiences of an occupational health course incorporating the BMg approach. The following main research question will therefore be investigated:

- What are the student musicians’ lived experiences of a musicians’ occupational health course incorporating the BMg approach?

In order to answer the main research question, the following sub-questions will be explored, guided by the specified study aims:

- What are the students’ experiences, perceptions and understandings of the course and their associated biopsychosocial health and musicianship?
- What changes did the students perceive in themselves and their music-making as a result of the course?
- What are the students’ experiences of BMg as the somatic component of the course?
- How was the course experienced as the first of its kind in the local context?

1.5 RESEARCH DESIGN

The conceptual framework of this study is grounded in phenomenology. This philosophical orientation enables a phenomenological researcher who is not a philosopher to engage in "reflecting in a phenomenological manner on the living meanings of everyday experiences, phenomena, and events" (Van Manen 2014:23). The specific approach to qualitative data analysis used in this study is Interpretative Phenomenological Analysis (IPA), which is concerned with exploring lived experience and is underpinned by hermeneutics, phenomenology and idiography (Smith, Flowers & Larkin 2009). This qualitative investigation offers an interpretation of the students' in-depth personal experiences of the musicians' occupational health course (MOHC). The researcher's interpretation, which aims to portray deeper understanding, meaning and sense-making, is recognised and valued in IPA (Smith et al. 2009).

The MOHC was run at the music department of a South African university, with the sample of 12 study participants who had been purposively selected from the MOHC class attendees. Primary data collection was done by means of semi-structured interviews before and after the course. Smith et al. (2009) describe how an interview schedule is used flexibly to encourage the participant's involvement and how, after systematic qualitative analysis, the researcher's interpretative narrative account is presented in detail. Additional substantiating data was gathered from the students' journals, descriptive questionnaires, videos of the classes, the teachers' observations and my observations and reflections. Ethical practice was followed, including aspects, such as avoidance of harm, informed consent, support, confidentiality, anonymity and right to withdraw (Smith et al. 2009).

1.6 SIGNIFICANCE OF THE STUDY

This study is the first of its kind with regard to preventative coursework in musicians' occupational health at a university in South Africa. The findings will therefore be of interest to tertiary level music institutions, both locally and abroad, in that they will provide interdisciplinary health, music, and education knowledge, and adaptable

curriculum information. This could impact policy and curriculum provision in all South African music education.

The research may therefore provide valuable findings on both the value of performance health coursework in higher education curricula, course content in general and the integration of BMg in such courses. The knowledge gained may benefit music students, professional musicians, music educators, music administrators and music medicine health practitioners. It will also be informative and developmental in the broader professional, training and research area of Performing Arts Medicine. This is especially important in South Africa where very little research has been done in the area of musicians' occupational health.

1.7 CHAPTER OUTLINE

The first chapter serves as an introduction and comprises the background, aims, research questions, research design, significance of the study and chapter outline. The literature review will unfold in the subsequent two chapters. Chapter 2 will include the relevance of the field of musicians' occupational health, the physical and psychological aspects of musical performance, the various categories of musicians' occupation-related disorders and prevention strategies. Chapter 3 discusses the literature on health education for musicians, BMg, and the field of somatic education and practices. The research design is presented systematically in Chapter 4, whereas Chapter 5 consists of the study results and interpretative phenomenological analysis of the data. Chapter 6, the discussion, conclusion and recommendations, contains the interpretative summary, the synthesis with the literature review and the answers to the research questions.

CHAPTER 2
MUSICIANS' OCCUPATIONAL HEALTH

2.1 INTRODUCTION

Making music is strongly associated with recreation, quality of life, and enhancing well-being, yet paradoxically, for musicians, there are health risks (Altenmüller 2016; Rosset-Llobet, Rosinés-Cubells & Saló-Orfila 2000:167). Anecdotal evidence, however, suggests that musicians are seen as a 'Cinderella' population who are expected to endure their problems because they are doing what they love. However, the need for specialist performing arts healthcare is widely endorsed because of the profound and far-reaching meanings of all the performing arts for society and the artists themselves (Hadok 2008:83). Whilst the cultural industries play an important role in an economy, their worth is far greater. Snowball (2016:1) highlights their multiple intrinsic values, such as "to entertain, to delight, to challenge, to give meaning", referring to culture and creativity as "the cement that binds together not only hearts and souls, but entire societies and nations" due to their positive impact on "social cohesion and nation-building through the promotion of intercultural dialogue, understanding and collaboration".

Musicians' occupational health falls within performing arts medicine (PAM), a comparatively new field focusing on the medical needs of dancers, vocalists, theatre performers, and instrumental musicians (Rosenbaum, Vanderzanden, Morse & Uhl 2012:1269; Dommerholt 2009:311). The term 'performing arts health' (PAH) is often preferred as it is broader and more inclusive of the multidisciplinary nature of the field (Guptill 2011b:269). PAM combines aspects of both sports and occupational medicine. Sports medicine is a common and popular subject in medical training, yet PAM is generally unknown. Although most professional sports teams have appropriate medical support, this is not the case in the performing arts industry. Despite the physical and psychological complexity of advanced musical performance skills, "there has traditionally been little or no health education or services to support this

population, in great contrast to the sporting population" (Ackermann, Driscoll & Kenny 2012:181). Dr Alice Brandfonbrener, iconic pioneer in the field of performing arts medicine, explains the need for performing arts medicine as a speciality: "It is critical to the good medical management of performing artists that it be conducted in the context of the art form" (Brandfonbrener 2006:747).

2.2 BACKGROUND AND RELEVANCE OF THE FIELD OF MUSICIANS' OCCUPATIONAL HEALTH

The earliest published description of musicians' medical problems was written by Ramazzini in 1713 (Harman 2010:1). In the 19th Century, the renowned vocal pedagogue, Manuel Garcia, did ground-breaking research into the physiology of the voice (Harman 2010:4), and 'musician's cramp' was acknowledged, along with the well-recognised 'writer's cramp' (Harman 2010:2). Schumann is the most well-known example of a musician from this era with a severe hand disability, which was probably focal dystonia (Guptill 2008:970). A contributing factor was a device he invented to try to strengthen his fingers (Palac & Grimshaw 2006:878). Singer's text on 'Diseases of the Musical Profession' appeared in 1932 (Harman 2010:3). Notable forerunners in the USA were piano pedagogue, Otto Ortman, who began a research lab at the Peabody Conservatory School of Music, and later Paul Rolland, with his Illinois String Research Project (Palac 2008:19). The traditional approach to music teaching in the first half of the 20th century was, however, still based on individual experience and opinions. According to Palac and Grimshaw (2006:878), "The fact that a performer's perception of how the self produces music is frequently inaccurate creates a pedagogical paradox for teachers and students that, if unsolved, produces a fertile ground for injury".

Coupled with an increase in PAM awareness in the 1980s, the field began to grow rapidly with the proliferation of numerous publications, associations, conferences and the establishment of performing arts medicine clinics (Harman 2010:7). A historical event organised in 1983 by Dr Alice Brandfonbrener was the first Medical Problems of

Musicians and Dancers symposium in Aspen, Colorado. This continues to take place as a significant annual conference (Harman 2010:7). The authoritative research and publications on the prevalence of medical problems amongst musicians by Australian physician and founder of the first Australian Performing Arts Medicine Society, Dr Hunter Fry, were important in promoting and establishing the field internationally (Fry 1988a; 1988b; 1987; 1986a; 1986b; 1986c; 1986d; 1984). The International Conference of Symphony and Opera Musicians' (ICSOM) landmark survey in 1988 gave considerable impetus to the development of research and public awareness (Fishbein, Middlestadt, Ottati, Strauss & Ellis 1988).

The field of PAM includes associations in more than 17 countries, and textbooks in numerous languages (Rickert, Barrett & Ackermann 2013:219). Peer-reviewed journals play a role in that they help to legitimise and disseminate research. The quarterly journal, *Medical Problems of Performing Artists* (MPPA), was launched in 1986, and in 1993 it became the official publication of the Performing Arts Medicine Association (PAMA), which was founded in 1989 (Harman 2010:10). The MPPA journal is now the official publication of the PAMA, the Dutch Performing Arts Medicine Association (NVDMG), and the Australian Society for Performing Arts Healthcare (ASPAH). The European Association of Medicine for the Arts (AEMDA), based in Paris, the British Association for Performing Arts Medicine (BAPAM), and the Deutsche Gesellschaft für Musikphysiologie und Musikermedizin (DGfMM) all publish journals (Harman 2010). Research and education centres exist in Germany, Holland, the United Kingdom, Australia, Canada, the Nordic countries, and the USA (Röijezon, Nyberg & Paarup 2014; Harman 2010). A significant step in working towards healthier practices in music education internationally was the establishment of the Special Interest Group (SIG) for Musicians' Health and Wellness by the International Society for Music Education (ISME) in 2012 (Rickert, Barrett & Ackermann 2015:427).

However, despite the expansion in the field of PAM since the 1980s and the efforts by many to include health promotion approaches, there is still resistance in mainstream music education. The prevailing attitude is still to push "the body, mind, and spirit to the limit for the sake of their art" (Palac & Grimshaw 2006:879). Misguided advice is

often given by well-meaning teachers who lack thorough knowledge. Therefore, “it seems obvious that more consistent guidance and education are necessary” (Palac & Grimshaw 2006:879). There is a general reluctance to include information about musicians’ wellness in music curricula. In addition, medical professionals are often ignorant of musicians’ issues, and musicians are frequently left to fend for themselves (Pierce 2010:58). Studies also show that internationally, awareness and interventions are vastly different and that “much further research, development and implementation is needed in both educational and professional contexts” (Williamon & Thompson 2006:412). Most importantly, education is necessary in tertiary performing arts institutions (Pascarelli & Bishop 1994). Pasacarelli and Bishop (1994:66) also suggest that “institutions could support the specialty’s further growth by creating staff consultant positions for medical arts providers”.

The development of reliable prevention programmes is critical (Manchester 2015:264). A sustainable and effective model is one in which a performing arts clinic serves as a referral centre (Manchester 2015:264). In Europe, there are some well-established performing arts clinics that are part of the country’s national health scheme (Manchester 2015:264). Medical clinics for performing artists vary in that some are attached to hospitals and/or universities, whereas others are private. Financial sustainability is a major challenge as performing artists are a small occupational group lacking medical insurance and largely working as freelancers. PAM practitioners suggest that the broader medical community views PAM as being of low importance, and thus highlight the need for education within the medical fraternity (Pascarelli & Bishop 1994). The economic challenge is that standard funding guidelines for both the arts and healthcare do not accommodate PAH. Education, building an awareness of the field, and lobbying government are necessary (Hadok 2008:84).

Rickert, Barrett and Ackermann (2013:219) discuss the need for PAM “to focus on creating healthy workplace environments where musicians are less likely to become injured”. A focus on the awareness of occupational health and well-being in the performing arts profession, including education and prevention, is therefore of paramount importance. Disability studies are necessary as this data is vital for health

insurance, workers' compensation, and state or private disability insurance. Performance-related health problems (PRHP) may or may not be covered under workers' compensation depending on their specific causality and therefore legitimacy as occupational disorders, as well as their severity and the degree to which one's ability to do the job is affected (Schuele & Lederman 2004:123). An additional challenge is the lack of interest from arts management in musicians' health needs (Dommerholt 2009:313). The economic consequences of PRHPs in musicians also need consideration as a PRHP will affect a musician's capacity to earn a living (Zaza 1998b:1020). According to Zaza (1998b:1020), "Many people do not view the arts as a legitimate profession, and the occupational health problems of musicians are seen as intriguing oddities rather than serious concerns".

From an economic perspective, however, PAH (performing arts health) is important. Worldwide, the broader cultural and creative industries (CCI) sector, which includes the performing arts, is estimated to contribute US$2,250 billion in revenue per year, creating 29.5 million jobs, 1% of the labour force and 3% of global gross domestic product (GDP), according to the recent global report, *Cultural Times* (EY 2015:1). In 2014, the cultural and creative industries created roughly 190 000 jobs in South Africa (SA). The sector is important for job creation, particularly since 60% of the workforce in these industries is younger than 30. In developing countries such as SA cultural and creative production are dominated by the informal economy (Snowball 2016:1). In the recent *Cultural Employment Report*, the South African Cultural Observatory found that the CCIs accounted for 2.93% of employment in SA, or 443 778 jobs, indicating that cultural occupations comprise a larger portion of employment in the SA economy than is often expected. The report highlights the volatility and stress of cultural employment due to unpredictability, short-term contracts, and conditions such as long working hours (Snowball & Hasidi 2017:2).

There is a pervasive lack of PAH awareness and knowledge in SA, with no clinics offering specialised medical services for performing artists (Devroop 2014:47). The field of PAH research in SA is in its infancy, and advocacy for its development is emerging. Devroop (2014:51), who proposed a model for research in performing arts

medicine in SA, stated that “the research model should include: (1) the establishment of research teams, (2) determination of prevalence rates of medical problems, (3) the identification of risk factors and, (4) education”. Panebianco-Warrens, Fletcher and Kreutz (2015:12) confirm the absence of musicians’ occupational health education in the curricula of SA tertiary music training institutions and recommend the inclusion of health promotion programmes “to address the challenges of music practice and performance, and to promote healthy lifestyles of evolving artists”. The challenges therefore need to be identified and understood. The discussion now turns to the physical and psychological challenges of musical performance.

2.3 PHYSICAL AND PSYCHOLOGICAL ASPECTS OF MUSICAL PERFORMANCE

Musical performance is rewarding, generates highly positive emotions, such as joy and satisfaction, and can have positive effects on health and well-being (Altenmüller & Ioannou 2016:105; Oakland, Macdonald & Flowers 2014:2). Musical training enhances brain interconnectivity and neuroplasticity, as well as cognitive, emotional and motor abilities (Altenmüller 2016:51). It is physically and mentally demanding, and long-term training and ongoing practice are required to reach advanced performance levels (Ioannou & Altenmüller 2015:135). Auditory-sensory-motor integration is highly developed and complex, and is combined with expressive, artistic and emotional communication skills (Altenmüller, Ioannou & Lee 2015:89). Altenmüller (2016:50) describes how playing or singing requires “not only the integration of multimodal sensory and motor information and its precise monitoring via auditory, kinaesthetic, or visual feedback, but also planning of movements and anticipation of sounds produced”. A consideration of the physiological aspects of music performance is therefore a good point of departure.

2.3.1 Performance Physiology

Physical and mental fitness are required of a professional musician to maintain a top performance level (Fotiadis, Fotiadou, Kokaridas & Mylonas 2013:93). In the past, musical performance was not seen as strenuous but more recent research has investigated the physiological demands thereof. Studying musicians from various genres, Vellers, Irwin and Lightfoot (2015:105) established that professional musicians, irrespective of genre, had significantly elevated heart rate responses in both rehearsal and performance. Similarly, Williamon, Aufegger, Wasley, Looney and Mandic (2013:4) determined that heart rate variability measures showed elevated stress levels caused by performing in public and when encountering challenging sections of the music. Iñesta, Terrados, García and Pérez (2008:10) found that cardiac demand in professional instrumentalists of varying genres during performance is significantly higher than in rehearsal and that in soloists, cardiac exertion is even more evident. The energy surge that the heart requires for performance indicates that it is important for musicians to be in good physical condition.

Musicians are frequently referred to as “small muscle athletes” because of the fine motor coordination required (Manchester 2009b:101). Musicians and athletes face similar demands, requiring expert sensorimotor integration, neuromusculoskeletal abilities, mental skills, and ongoing practice, often performing in socially evaluative contexts (Kenny & Ackermann 2009:390). Rietveld (2013:425) asserts that “during a symphony, the fingers of the violinist run a marathon; the same applies to the pianists’ fingers in a solo concerto. Dancing is top sport on the square metre, music on the square centimetre”. Altenmüller and Ioannou (2016:104) add a few other similarities, such as prolonged training, discipline, strategic decisions, social skills, emotional expression, and performance flair and personality. Risk factors for injury are similar, such as changes in the usual intensity, duration and frequency of practice, and changes in technique and equipment, and general physical conditioning, posture, and endurance (Schaefer & Speier 2012:317). Dick, Berning, Dawson, Ginsburg, Miller and Shybut (2013:397) mention various parallels, including the competition, the temptation of substance abuse, and the real risk of career-threatening injury. Robson

(2004:164) points out that the research in sports psychology may be helpful in determining how much competition is healthy in performing arts education.

PAM can therefore learn and borrow from sports medicine (Manchester 2011:2), which can offer established knowledge and practice in terms of injury prevention, performance psychology and nutrition, and improving performing artists' awareness of the benefits of investing in personal wellness and exercise to enhance performance. Through collaborative performance research, the benefit is reciprocal, as sports scientists acquire knowledge in performing artists' unique needs such as hearing loss and vocal health, as well as aspects of performing arts such as creativity and rhythm that are beneficial for athletes (Dick et al. 2013:397).

However, a significant difference between athletes and musicians is that whilst many sports' injuries are caused by physical contact and high impact, musicians' injuries are usually related to the repetitive movements of the distal upper limb muscles, and the static use of the trunk and proximal muscles (Schaefer & Speier 2012:316). White, Hayes, Jamieson and Pilowsky (2003:334) note that in this way, musicians' concerns have much in common with those treated in occupational medicine such as machinists or any type of computer keyboard operators. Occupational medicine is an established field focusing on workplace health concerns, and can offer well-founded methods and theories that are transferable to PAM, especially aspects derived from preventative medicine (Manchester 2013:2). The repetitive movements of instrumental performance require expert coordination, precision, speed, control, flexibility and beauty (Horvath 2001:102; Meinke 1998:56). The snare drum player in Ravel's *Bolero* has 5 144 repeated continuous arm strokes in 14 minutes, and in Handel's *Messiah*, a cellist has 740 right arm movements in 2 minutes (Horvath 2001:102). In the first movement of Tchaikovsky's violin concerto, the solo violinist's bow arm has between 50 and 300 back-and-forth movements per minute (Ackermann 2010:247).

Consideration of the artistic and auditory aspects is essential. Ackermann and Adams (2004b:671) note that musicians' movements are not only functional, but also artistic and expressive gestures, because expression of emotion is an intrinsic part of a

performing art (Manchester 2011:1). Auditory feedback in music performance is a critical element (Altenmüller & Ioannou 2016:104). Meinke (1994:67) refers to the subtle and ever-changing complexities of music-making as production of sound by the body. Reminding us that “music is what happens between the notes”, he suggests that researchers and medical interventions acknowledge the dynamic artistic, physiological, and psychological intricacies of music-making (Meinke 1994:67). Performance psychology is therefore fundamental to this composite process.

2.3.2 Performance Psychology

Among professional performers, especially of Western art music, the number of positions has decreased. In addition, expectations with regard to standards have increased, and competition for work is a reality, resulting in anxiety, tension, and high stress levels. Competitive drive and perfectionism often replace the original intrinsic enjoyment of playing music. Even top professionals acknowledge having to cope with severe music performance anxiety (MPA). Oakland, Macdonald and Flowers (2014:3) state that career satisfaction is also related to a balance between perceived artistic autonomy and having to fulfil others’ artistic choices.

According to Altenmüller, Ioannou and Lee (2015:105), musicians experience such fulfilment, enjoyment, and emotional ‘chill responses’ from playing, that this may sometimes lead to over-practising and over-riding the body’s limits. Musicians’ love for music may, in fact, be detrimental to their well-being when it becomes or fuels an obsessive perfectionism. Similarly, Bonneville-Roussy, Lavigne and Vallerand (2010) investigated the concept of passion as a motivational mechanism in expert musicianship. In doing so, they explored a dualistic model based on harmonious passion versus obsessive passion. Whereas the former is adaptive, positive, utilises deliberate practice, and nurtures intrinsic well-being, the latter is more ambiguous, comparative, driven by extrinsic factors, and undermines happiness. The authors suggest the incorporation of behavioural skills such as these in tertiary level musical training to promote well-being and enhance performance. Montello (2010:113) similarly describes the emotional distress that results when musicians’ self-worth is

based on external assessments of their performances. Driven by an obsessive striving for perfection, some of the characteristics of their condition are low self-esteem, compulsive behaviour, a need for external approval, isolation, extremes of emotion, anxiety, and depression (Montello 2010:113).

Performance psychology for athletes and performing artists is similar, and many sports psychology approaches to mental skills training for athletes are transferable to the performing arts (Hays 2002). Conroy, Poczwardowski and Henschen (2001:320) investigated perceptions of failure and success in elite athletes and performing artists, including fear of failure and fear of success, and the effects on motivation and emotion. Failure and success were not perceived as opposites; rather, their association was perceived as being highly nuanced and complex. Factors emerging were human needs, context, performers' realities, an overlap between failure and success, and a need to distinguish between objective and subjective failure and success. Also exploring positive performance experiences, Kirchner (2011) examined the characteristics of flow as defined by Csikszentmihalyi and outlined practical applications for musicians. Flow may allow for anxiety to become facilitative rather than debilitative, because characteristics of a flow state include total absorption in the task, the matching of challenge and skill level, specific goals, and confidence to accomplish them, immediate feedback, a sense of control, no pre-occupation with self, a sense of timelessness, and enjoyment and positive emotions. Predictors of flow, such as self-confidence and self-trust in one's playing, an intention to express and experience musical emotion, nurturing experiential goals, maintaining focus on the music, and performing without self-criticism or concern over external judgement, are skills that can be integrated into practice, performance, and music pedagogy. Kenny (2011:6) explains the state of flow as follows:

> During a state of flow, the person has a sense of spontaneous, effortless performance and total immersion and focus on the activity to the exclusion of other environmental or internal stimuli. Such states are, paradoxically, the culmination of discipline, dedicated practice, concentration, and perseverance: they occur when the challenges are matched with the necessary underlying skills and the honing of those skills to achieve mastery.

Similarly, Steinfeld and Brewer (2015:86) examined the benefits of applying mindfulness techniques to musical practice and performance, noting the resulting flow states and embodied musical practice, and the ability to distinguish between self-awareness and self-criticism. The ability to remain present without judgment is a vital tool in developing confident performance states. Healthy self-observation and self-development skills that are not dependant on external validation or criticism may "lead to performances that not only transform themselves but their listeners as well" (Steinfeld & Brewer 2015:88). Likewise, a review by Rodríguez-Carvajal and De La Cruz (2014) documented that mindfulness increased the quality of musical performance. The facilitative aspect of increased arousal was enabled, and mindfulness also improved musicians' psychological well-being. Relaxation techniques, mindfulness, meditation and visualisation aid the reduction of stress and enable an optimal mind-body state for performance, thus facilitating 'flow' (Montello 2010:111).

Altenmüller and Jabusch (2009:150) also examined the unique psychological duality inherent in musicians' performance in that the love for the music exists in conjunction with the fear of mistakes and failure. This aspect of performance psychology will be discussed in more depth later, together with the research on MPA.

Having provided insight into the physiology and psychology of performance, the question arises as to the prevalence of health issues among musicians. The literature on the pervasiveness of musicians' performance-related disorders will therefore be addressed in the following section.

2.4 MUSICIANS' OCCUPATION-RELATED DISORDERS

Although music is acknowledged to have health benefits throughout the lifespan, musicians are susceptible to performance-related disorders, regardless of age, genre, and cultural background[6]. These are occupationally disruptive and can be professionally, personally, socially and financially devastating (Chan, Driscoll & Ackermann 2014:181; Stanhope, Milanese & Grimmer 2014:133). They may also be highly emotionally destructive since the musician's core identity as a musician is affected, and many musicians have a very close relationship with their instrument (Guptill 2011c:92). Andersen, Roessler and Eichberg (2013:124) discuss the 'private nature' of musicians' pain, and the fact that occupational pain is accepted as normal. Musicians tend to underestimate and conceal their PRHP (Zuskin, Schachter, Kolcić, Polasek, Mustajbegović & Arumugam 2004:249) as an injury is often misunderstood as being a deficiency (Bindel 2013:30). Professional musicians have confidentiality needs due to concerns related to losing work (Brandfonbrener 2006:748). Diagnosis may also be challenging due to a lack of consensus on causes, terminology and what constitutes recovery as even mild symptoms might impact performance (Guptill & Golem 2008:307).

2.4.1 General Prevalence of Musicians' Occupation-Related Disorders

Since the 1980s, the high prevalence of performance-related health problems (PRHPs) in musicians has been well documented. PRHP broadly refers to all occupation-related health problems experienced by musicians, while the term 'performance-related musculoskeletal disorder' (PRMD) is used to refer to musculoskeletal conditions in particular. Zaza, Charles and Muszynski (1998:2016) developed the widely-used operational definition for PRMD, namely "pain, weakness,

[6] Chan, Driscoll and Ackermann (2014:181); Ackermann, Driscoll and Kenny (2012:181); Mehrparvar, Mostaghaci and Gerami (2012:193); Leaver, Harris and Palmer (2011:549); Hoppmann (2010:207); Dommerholt (2009:312); Kenny and Ackermann (2009:390); Guptill and Golem (2008:307); Horvath (2008:31); Foxman and Burgel (2006:309); Lederman (2003:549); Rosset-Llobet, Rosinés-Cubells and Saló-Orfila (2000:167).

lack of control, numbness, tingling, or other symptoms that interfere with your ability to play your instrument at the level you are accustomed to". It is clear that this definition excludes common mild aches and pains. The occurrence of PRHPs and PRMDs has been measured in various ways: cumulative prevalence, point prevalence and incidence. Cumulative prevalence, prevalence and lifetime prevalence all refer to the number or percentage of the specific population that have or have had the condition being studied. Point prevalence is the number or percentage that currently has the condition. Incidence is the number or percentage that has the condition during a defined period of time (Manchester 2009a:55).

The seminal large-scale ICSOM study by Fishbein, Middlestadt, Ottati, Strauss and Ellis (1988) surveyed medical problems among musicians from 48 orchestras, with 82% of respondents reporting having experienced a medical playing-related problem. Notable was the fact that 76% reported experiencing at least one problem that was severe enough to interfere with their performance, with 36% reporting having had four severe problems. Musicians under the age of 35 were most frequently affected with severe problems, and in general, females were more susceptible.

According to Spahn, Hildebrandt and Seidenglanz (2001:24), several studies conducted worldwide report that about two-thirds of professional musicians and at least half of student musicians experience PRHP. This correlates with other authors,[7] who state that the prevalence of PRHP ranges roughly from 40% to 90%. The exact research results on the prevalence of PRHP vary due to differences in diagnostic criteria, data gathering, definitions, population and methodology (Kok, Huisstede, Voorn, Schoones & Nelissen 2016:392; Guptill 2011b:269; Cebriá I Iranzo, Pérez Soriano, Igual Camacho, Llana Belloch, & Cortell Tormo 2010:98).

[7] Dommerholt (2009:312); Guptill (2008:971); Guptill and Golem (2008:307); Wu (2007:43); Foxman and Burgel (2006:310).

The majority of PRHPs amongst musicians are musculoskeletal.[8] Amongst all those registering at BAPAM clinics in 2013, a PRMD was the main issue in 70% of patients (Charnock, Hicks & Hayhurst 2014:3). A recent review, including European, North American, South American, Asian, and Oceanic studies found the lifetime prevalence of PRMD among professional musicians to range from 62% to 93% (Kok et al. 2016:377). According to Ackermann, Kenny, O'Brien and Driscoll (2014:5), roughly 80% of musicians will experience PRMD, which is also a common occurrence among talented school-going musicians. Similarly, a study by Edling and Fjellman-Wiklund (2009:113) revealed that about 80% of music teachers had experienced a PRMD in the previous year. Surveys confirm that PRMDs are also experienced by part-time and amateur musicians (Kok, Groenewegen, Huisstede, Nelissen, Rietveld & Haitjema 2018; Mehrparvar, Mostaghaci & Gerami 2012:193; Morse, Ro, Cherniak & Pelletier 2000:81).

In general, string and keyboard players are the most susceptible to PRMD compared to other instrument groups (Rietveld 2013:431; Guptill & Golem 2008:307; Hansen & Reed 2006:790). Female musicians experience PRMD more frequently than their male counterparts (Kok et al. 2016:392; Rosenbaum et al. 2012:1270; Edling & Fjellman-Wiklund 2009:113; Heming 2004), and most PRMDs affect the neck, upper limb and back (Fjellman-Wiklund, Brulin & Sundelin 2003:33). About 12% of professional musicians give up their careers due to PRMD (Abreu-Ramos & Micheo 2007:97). Most research documents a lower injury rate among older professional musicians and is often described as the 'healthy worker effect' in which those with pain have changed profession, or those who remain in the profession have optimised their playing strategies or developed increased tolerance (Smith 1992:133).

Apart from musculoskeletal problems, musicians may also experience MPA (music performance anxiety), tinnitus, noise-induced hearing loss, fatigue and disrupted sleep

[8] Schuele and Lederman (2004:124); Zuskin et al. (2004:248); Lederman (2003:551); Rosset-Llobet et al. (2000:173); Fishbein et al. (1988:7).

patterns (Foxman & Burgel 2006:309). Vocal problems are experienced by singers and music teachers (Hackworth 2007:20; Foxman & Burgel 2006:309), and symptoms include hoarseness, irritation, vocal pain and fatigue, as well as vocal fold conditions, such as nodules or haemorrhage (Rodríguez-Lozano, Sáez-Yuguero & Bermejo-Fenoll 2011:150). In woodwind and brass players, orofacial problems include temporomandibular disorders, orthodontic problems, bruxism, focal dystonia, and herpes (Rodríguez-Lozano et al. 2011:150). The force and pressure in high resistance wind instruments can cause elevated intraocular pressure (Marmor 2010; Foxman & Burgel 2006:309). Among the upper string instruments, orofacial conditions, such as temporomandibular disorder, affect the craniocervical and jaw area (Rodríguez-Lozano et al. 2011:150; Bejjani et al. 1996:408). Skin conditions caused by playing and which impair performance are mainly contact allergies (to substances such as rosin, nickel, and exotic woods) and conditions such as allergic eczema (Gambichler, Boms & Freitag 2004). Dermatitis, known as 'fiddler's neck', occurs frequently on the left side of the neck in roughly two-thirds of violinists and violists (Rodríguez-Lozano et al. 2011:154; Ostwald, Baron, Byl & Wilson 1994:49). Visual challenges are often presented by lighting on stage, visibility of music, glare, differences in the musician's near and far sight, and aging eyes in general (Beckers, Van Kooten-Noordzij, De Crom, Schouten & Webers 2016:143; Marmor 2010).

After presenting a general overview of the prevalence and types of PRHPs in musicians, it is now suitable to examine the occurrence of PRHPs in specific occupational groups of musicians.

2.4.2 Prevalence of Occupation-Related Disorders in Orchestral Musicians

Orchestral musicians reported enjoyment of their profession, yet the majority had PRMDs (Lima, Pinheiro, Dias & De Andrade 2015:278). The concerning prevalence of PRHPs in orchestral musicians has been well-documented in the literature, and the key findings on PRHP prevalence data have been summarised in Table 2-1.

Table 2-1: Prevalence of occupation-related disorders in orchestral musicians

FINDING	STUDIES
PRMD point prevalence of about 50%	Ackermann, Driscoll and Kenny (2012) Manchester (2006) Davies and Mangion (2002)
PRMD lifetime prevalence of about 80%	Berque, Gray and Mcfadyen (2016) Fotiadis, Fotiadou, Kokaridas and Mylonas (2013) Abreu-Ramos and Micheo (2007)
Female musicians more susceptible to PRMD	Fotiadis et al. (2013) Leaver, Harris and Palmer (2011) Abreu-Ramos and Micheo (2007) Kaneko, Lianza and Dawson (2005) Davies and Mangion (2002:161)
String musicians most affected instrument group	Fotiadis et al. (2013:94) Abreu-Ramos and Micheo (2007) Crnivec (2004) Davies and Mangion (2002)
PRMDs mostly affect the back, neck and upper limb	Fotiadis et al. (2013) Ackermann, Driscoll and Kenny (2012) Leaver, Harris and Palmer (2011)
Almost 80% had never received any information on musicians' health, injury prevention or appropriate treatment.	Fotiadis et al. (2013)
Preventative strategies were rare and only happened after PRMD had manifested.	Lima, Pinheiro, Dias and De Andrade (2015)
Less than 50% of those who reported a previous injury had completely recovered.	Ackermann, Driscoll and Kenny (2012)
Roughly two-thirds experienced MPA that negatively impacted their playing.	Kaneko, Lianza and Dawson (2005) James (2000)

The physical and mental aspects of PRHPs are frequently linked. Muscular tension, pain and symptoms were associated with psychological issues, such as anxiety, MPA and depression.[9] Ackermann, Kenny, O'Brien and Driscoll (2014:9) and Leaver et al. (2011:553) raise the concern that musicians may somatise their emotional distress. Kaneko, Lianza and Dawson (2005:173) highlight the links between pain, emotional stress and personality characteristics, stating the need for a biopsychosocial approach to the treatment of musicians' pain. The data on orchestral musicians' lifestyles also endorses this need. Ackermann, Driscoll and Kenny (2012:184) found that roughly 30% of musicians' alcohol consumption was higher than the national health standards and that less than 50% of the musicians studied by Abreu-Ramos and Micheo (2007:99) exercised.

Kaneko et al. (2005:172) note that musicians may not acknowledge pain as a health problem because about three-quarters of their participants reported that they had no health problems, yet about two-thirds reported experiencing pain. Similarly, Voltmer, Zander, Fischer, Kudielka, Richter and Spahn (2012) found that the orchestral musicians in their study reported higher physical health scores, but lower mental health scores than the control group. The perception of greater physical health may have been due to "the unhealthy normalizing of playing-related symptoms. Together with the significantly lower mental health scores, this emphasizes the need for appropriate prevention and health promotion strategies" (Voltmer et al. 2012:13).

More integrated biopsychosocial approaches are a recent development in the research, such as the Sound Practice Project, which investigated psychological and physical illness in all of Australia's major professional orchestras (Rickert, Barrett & Ackermann 2014b:125). This led to the Sound Practice Health Handbook for Orchestral Musicians (Ackermann, Kenny, Driscoll & O'Brien 2015), which provides information on both the physiological and psychological aspects of performance for

[9] Lima et al. (2015:278); Ackermann, Kenny, O'Brien and Driscoll (2014:9); Kaneko, Lianza and Dawson (2005:173); Davies and Mangion (2002:163); James (2000:199).

orchestral musicians. The Sound Practice Project Final Report (Ackermann, Kenny, Driscoll & O'Brien 2017) provides an overview of the project and its goals and partner organisations, as well as an outline of the research studies. Interventions included: onsite injury diagnosis and advice (triage); exercise classes and DVD development; music performance biomechanics assessment; short-term dynamic psychotherapy; ear protection devices; acoustic screen usage; education of musicians; education of music administrators; and the education of health professionals. Future developments include hearing conservation strategies and the development of several physical and psychological health strategies and recommendations.

In addition to orchestral players, it is essential to consider the needs of popular musicians because performers of diverse genres experience occupational health problems. A synopsis of the research on popular musicians' occupational health will be described in the next section.

2.4.3 Prevalence of Occupation-Related Disorders in Popular Musicians

Kenny and Asher (2016) found that popular musicians have a shorter life expectancy, mortality rates twice as high as those of a comparable general population, and higher mortality rates due to violent causes. In addition, there were elevated rates of suicide and liver-related disorders in country, metal, and rock musicians. Raeburn (1999) wrote about psychological problems among popular musicians belonging to the many non-classical genres including rock, jazz, blues, soul, funk, rap, reggae and country. Additionally, Raeburn (2000) highlighted the high levels of alcohol and drug use, abuse, and dependence among popular musicians, as well as cases of severe depression and suicide. Raeburn, Hipple, Delaney and Chesky (2003) indicated that while most of the popular musicians who had taken part in their survey were interested in psychotherapy, they could not afford it.

Research on the occurrence of PRHPs in popular musicians has documented results comparable with research outcomes reported on Western classical musicians. An

overview of PRHP prevalence statistics drawn from the musicians' health literature on popular musicians is illustrated in Table 2-2.

Table 2-2: Prevalence of occupation-related disorders in popular musicians

STUDY	PARTICIPANTS	FINDINGS
Heredia, Hinkamp, Brodsky and Llapur (2014:80)	Musicians of the Orquesta Buena Vista Social Club	• 67% one-year prevalence of PRMD
Buckley and Manchester (2006:80)	Amateur folk instrumentalists	• 54% lifetime prevalence of PRMD • 19% point prevalence of PRMD
Raeburn, Hipple, Delaney and Chesky (2003)	Popular musicians	• 79% one-year prevalence of PRHP • About 50% experienced at least one non-musculoskeletal problem, most frequently depression and anxiety (as well as stage fright, sleep disturbance, drug/alcohol problems, and vocal disorders) • About 40% suffered hearing loss
Brodsky (1995)	Blues musicians	• 67% one-year prevalence of at least one PRHP • 44% of the musicians did not have health insurance
Newmark and Salmon (1990:108)	Rock, folk, rhythm and blues, bluegrass, and blues instrumentalists	• 44% lifetime prevalence of PRMD

Among the Blues musicians that Brodsky (1995) studied, the emotional and physical stresses of their lifestyles together with exposure to alcohol and drugs was a potentially destructive combination, and many denied their medical problems for fear of losing gigs. The New Orleans Music Clinic (NOMC), a viable support service for musicians, serves many jazz musicians who face health challenges associated with financial instability, frequently being 'on the road', and irregular and late hours (Bultman 2007:135). Due to being without medical insurance, "for many musicians, the NOMC is their only source of support – whether it be medical, emotional, financial, or social" (Ibid. 2007:135).

Herer (2005) investigated tuberculosis (TB) in musicians, and examined the links between the socio-economic status of musicians and potential increased risk of TB, and infectivity of TB associated with group and community musical activities. He noted that non-classical musicians may live a lifestyle that has a negative impact on their health, often experience limited access to health care, and may have drug or alcohol-related problems.

Indian tabla players were found to experience similar PRMDs to those of other percussionists (Mishra, De, Gangopadhyay & Chandra 2013:8). Mehrparvar and colleagues (2012:195) documented a high prevalence of PRMD (44.4%) among Iranian instrumentalists playing traditional and Western instruments. Interestingly, Iranian amateur music students playing traditional instruments were found to have a 53% prevalence of PRMDs (Sadeghi, Kazemi, Shooshtari, Bidari & Jafari 2004:4). Kim, Kim, Min, Cho and Choi (2012:217) reported that the neck, shoulder, back and knee were the most frequent sites of PRMD symptoms in traditional Korean string instrumentalists. This is different to Western instrumentalists where most PRMDs are in the upper limbs. The older players with longer careers and developed skills were found to have a lower frequency of symptoms, which correlates with the research findings on Western musicians.

This raises the question of the performance-related health of younger musicians. The following section will examine the literature on the prevalence of PRHPs among adolescent and tertiary student musicians. This is vital in order to gain a deeper understanding of the population most relevant to this research study.

2.4.4 Prevalence of Occupation-Related Disorders in Adolescent and Tertiary Music Students

Research on young musicians and student groups has found the prevalence rates of PRHP similar to, and in some cases, higher than those found among professional players (Horvath 2008:31). Table 2-3 illustrates examples of the research on pre-tertiary and tertiary student musicians and the prevalence rates of various PRHPs. A

similar range of PRHP prevalence has been found among tertiary student musicians in a number of other research studies.[10] Some authors focused on a particular genre, such as university-level jazz students (Devroop 2016); marching band musicians (Beckett, Seidelman, Hanney, Liu & Rothschild 2015); college marching band musicians (Moffit, Russ & Mansell 2015); marching band student musicians (Hatheway & Chesky 2013); elite marching musicians (Levy, Lounsbury & Kent 2009); and a comparison of classical student musicians with rhythmic (jazz, pop and rock) student musicians, both instrumentalists and vocalists (Árnason, Árnason & Briem 2014). Other studies investigated particular instrumentalists, such as classical woodwind students (Stanhope, Milanese & Grimmer 2014), or tertiary piano students (Blackie, Stone & Tiernan 1999).

Table 2-3: Prevalence of occupation-related disorders in adolescent and tertiary music students

STUDY	PARTICIPANTS	FINDINGS
Rodríguez-Romero, Pérez-Valiño, Ageitos-Alonso and Pértega-Díaz (2016)	Tertiary music students	• 48.5% point prevalence of musculoskeletal pain (MSP)
Baadjou, Verbunt, Van Eijsden-Besseling, Huysmans and Smeets (2015)	Tertiary music students	• 67% point prevalence of PRMD
Kok, Nelissen and Huisstede (2015)	Tertiary music students	• 81% one-year prevalence of PRMD of the upper limb (compared to 42% in the comparison group) • 47% point prevalence of PRMD (compared to 18% in the comparison group) • 36% had chronic conditions, lasting 3 months or longer (compared to 10% in the comparison group).

[10] Lonsdale and Boon (2016); Kok, Vlieland, Fiocco and Nelissen (2013); López and Martínez (2013); Wristen and Fountain (2013); Kenny, Martin and Cormack (2009a); Kenny, Cormack and Martin (2009b); Barton et al. (2008); Guptill, Zaza and Paul (2005); and Guptill, Zaza and Paul (2000).

Ioannou and Altenmüller (2015)	Tertiary music students	• 89% experienced a PRHP during their studies. • 13% always experienced pain when playing. • PRHP average onset age was 15 years.
Norton and Greasley (2014)	Tertiary music students (instrumentalists and vocalists)	• 78% had experienced PRHPs. • 22% point prevalence of pain • 14% had pain lasting longer than three months. • 72% had experienced MPA. • 25% had received health education.
Brandfonbrener (2009)	First-year tertiary music students (instrumentalists and vocalists)	• 79% reported having had PRMD. • 37% reported having had MPA.
Spahn, Strukely and Lehmann (2004)	First-year tertiary music students	• 25% point prevalence of playing-related symptoms • Significantly more musculoskeletal symptoms were reported by the music students compared to the comparison groups. • 33.5% of the music students had elevated anxiety scores, which were higher than those of the comparison groups.
Nawrocka, Mynarski, Powerska-Didkowska, Grabara and Garbaciak (2014)	Adolescent musicians	• 88% one-year prevalence of musculoskeletal pain (MSP)
Britsch (2005)	Pre-tertiary youth orchestra musicians	• 75% experienced MPA.
Brown (1997)	Pre-tertiary youth orchestra string players	• 67% had experienced shoulder pain but were reluctant to admit to this, fearing the loss of their hard-earned position in the orchestra.

A concern is that young musicians may be reluctant to disclose their problems or seek medical help. Ioannou and Altenmüller (2015:137) found that 35% of the students with PRHPs did not seek treatment, indicating that asking for help is still a taboo. Those who did first sought help from their teacher, indicating that teachers should be

equipped by receiving preventative education during their training. Students were in favour of musicians' health education, acknowledging the importance of physical conditioning, correct technique, and acquiring basic anatomical knowledge. College obligations permitted less than a third of the students with playing-related pain to properly follow medical instructions, and many continued playing with pain from time to time. Alarmingly, only 9% never played in pain (Ioannou & Altenmüller 2015:141). Instrumental teachers' reactions mostly varied between advising some rest, focusing on inappropriate technique, and claiming "it's nothing serious, it happens" (Ioannou & Altenmüller 2015:137).

It is also clear from the statistics that pre-tertiary musicians are already experiencing difficulties. Vinci, Smith and Ranelli (2015:148) reported that PRMDs were common in adolescent string musicians. Burkholder and Brandfonbrener (2004:122) similarly documented that musculoskeletal diagnoses were common among adolescent student musicians treated at a performing arts clinic. Frequent symptoms were excessive muscle tension and pain, and prevalent characteristics were poor physical condition and instrumental technique.

Student musicians seem to be more at risk when entering university as their amount of playing or singing increases (Jansen, Dittrick, Narvaez, Boyette & Staines 2006:450). They usually do not have knowledge of injury prevention and tend not to seek treatment once injured (Lee, Carey, Dubey & Matz 2012:85). Among the first-year music students surveyed by Williamon and Thompson (2006:423), pain, discomfort, and MPA were reported as common, and there was an association with posture and excessive practising. Hildebrandt, Nübling and Candia (2012) investigated the psychological well-being of first-year university music students, and found significant increases in fatigue, depression and MPA at the end of their first year as compared to the beginning of the year. The authors recommend programmes including stress coping skills, physiological education, body awareness, performance psychology, study skills and time management, confirming that mandatory first-year programmes including this content have resulted in increased student well-being and a decrease in MPA (Hildebrandt et al. 2012:47).

Health-promoting behaviours of student musicians have also been investigated, demonstrating low scores in various aspects of health behaviour.[11] Rickert, Barrett & Ackermann (2015:13) found that the student cellists they studied had poor health behaviours and awareness, including not responding to injury, and playing through pain. Williamon, Wasley, Burt-Perkins, Ginsborg and Hildebrandt (2009:85) expressed concern about the generally poor fitness levels of tertiary student musicians, considering the physicality of musical performance. There was a correlation between student fatigue and aspects such as perfectionism, trait anxiety, health promotion, and self-regulated learning.

Research on student musicians' hearing health, vocal problems, and psychosocial aspects will be explored in the relevant focused sections. The literature on adolescent and tertiary student musicians displays overwhelming evidence of the unacceptably high levels of PRHPs, lack of preventative knowledge, and poor health behaviours. It is therefore imperative to acknowledge the serious need for effective injury prevention and health promotion education in the tertiary training of musicians to address the clear lack of health literacy. This will be examined in-depth in the chapter on health education for musicians.

As amply documented in the literature in the four preceding sections, it is clear that PRMDs are very common in musicians of diverse genres and at all levels. Yet, according to Abreu-Ramos and Micheo (2007:97), most PRMDs are preventable because they are caused by poor posture, problematic technique, inadequate training or poor physical conditioning. Having presented an overview of the research on prevalence, further insight can therefore be gained through knowledge of the risk factors for PRMDs. The next section will therefore investigate the multifactorial and interactive causes of PRMDs.

[11] Spahn, Nussek and Zander (2014); Ginsborg, Kreutz, Thomas and Williamon (2009); Kreutz, Ginsborg and Williamon (2008a); Kreutz, Ginsborg and Williamon (2008b); and Spahn, Richter and Zschocke (2002).

2.4.5 Risk Factors for Musicians' Occupation-Related Disorders

The multiple risk factors for PRMDs include highly repetitive movements, awkward postures, long hours of playing, maladaptive movement patterns, sudden increase in practice, lack of rest breaks, poor practice methods, deficient technique, inadequate physical condition, instrument, susceptible anatomical characteristics, instrument set-up, instrument changes, MPA, and environmental factors such as demanding work or study schedules, badly-designed seating, ambient temperature changes, poor light and score visibility, demanding repertoire and carrying heavy equipment and instruments (Chan, Driscoll & Ackermann 2014:181; Ackermann 2010:248). Wu (2007:47) highlights the multifactorial etiology of PRMDs as risk factors and their combinations are widely variable. The predisposing factors for PRMDs are frequently grouped as intrinsic or extrinsic. Intrinsic factors encompass the innate physiological and psychological characteristics of the musician, whilst the extrinsic aspects are the external contributing factors (Mehrparvar, Mostaghaci & Gerami 2012:193; Barton, Killian, Bushee, Callen, Cupp, Ochs, Sharp & Tetrault 2008:73; Kenny & Ackermann 2009:390).

Several authors state that poor practice habits are a significant causal factor for PRMDs together with postural demands and repetition.[12] Over- or misuse is probably responsible for most PRMDs; however, it is both qualitative and quantitative in that both intensity and duration are involved (Bird 2013b:14; Lederman 2010:53). Rietveld (2013:431) emphasises that the repetitive motions alone do not cause the injury. Efficiency in muscle use is critical as a technique with excess muscle tension and poorer coordination is associated with overuse and pain (Wu 2007:47; Bejjani, Kaye & Benham 1996:407). Meidell (2011:63) notes that the three primary causal factors in musculoskeletal pain are repetition, posture and force. Buchanan and Hays (2014:2) elaborate on the combination of refined and repetitive movements together with poor

[12] Rosenbaum et al. (2012:1270); Guptill (2011b:269); Ackermann (2010:248); Hoppmann (2010:225); Dommerholt (2009:313); Wu (2007:47).

quality movement and misalignment, explaining that “effective movement is paramount in music-making due to the highly refined and intensely repetitive nature of performance”. It is also essential to acknowledge other activities or jobs that can cause or aggravate musicians’ injuries and together have a cumulative effect on posture (Manchester 2012:1; Ackermann 2010:248; Foxman & Burgel 2006:309).

Gender is a risk factor as studies often show that women are at higher risk for PRMDs than men (Rosenbaum et al. 2012:1270; Brandfonbrener 2010:29; Barton et al. 2008:73; Wu 2007:47), although focal dystonia is more prevalent in men (Rietveld & Leijnse 2013:482; Altenmüller 2009:9). According to Manchester (2009a:55), adolescent females are particularly vulnerable to playing-related problems. Horvath (2008:31) discusses specific factors arising among adolescent musicians, including the common belief that playing in pain is acceptable, inadequate rest, limited conceptual understanding, sudden growth spurts, distraction due to the psychosocial aspects of peer relationships, inferior equipment, stress relating to changes in technique or teacher, incorrect biomechanics, and postural problems. Blackie, Stone and Tiernan (1999:141) point out that students often develop PRMDs related to sudden increased practice intensity prior to recitals or exams.

The instrument itself is a factor. Keyboard and string instrumentalists are at the greatest risk for injury (Lee, Carey, Dubey & Matz 2012:85; Brandfonbrener 2010:30; Barton et al. 2008:76). Also related to the instrument are aspects, such as shoulder and chin rests in violin and viola, thumb rests on the clarinet, mechanical differences between instruments, instrument size and weight (Brandfonbrener 2010:30). Sustained muscular contraction and joint loading are factors in the right thumb of clarinettists (Kenny & Ackermann 2009:391). Hyper-extensible joints is a risk factor for PRMD (Schaefer & Speier 2012:317; Miller, Peck, Brain & Watson 2003:1815) as musicians with hyper-mobility may develop increased muscle contraction to stabilise the ligamentous lax joint, which can lead to spasm, pain and nerve entrapment (Rosenbaum et al. 2012:1269; Brandfonbrener 2010:30).

Musical theatre performers face occupational health risks, such as vocal issues, stage hazards, respiratory issues caused by special effects, intense schedules, unhealthy lifestyles and the disruptions of touring. A common issue is the raked stage which presents difficulties relating to movement, shoes and awkward postures (Morton 2015:2; Brandfonbrener 1997b:47). Pit musicians playing in musical theatre shows often work in cramped spaces, causing postural restriction and compromised ergonomics (Morton 2015:6).

Occupational medicine research in diverse settings has shown that posture is a critical factor in the development of work-related injuries, especially of the neck, shoulder, wrist, hand and lower back (Manchester 2014a:1). Steinmetz, Seidel and Muche (2010:610) found that 93% of the professional instrumentalists who experienced PRMDs presented dysfunctions of postural stabilisation, implicating impairments of the lumbopelvic stabilisation system and imbalances in the head and shoulder regions. Common postural factors are general body tension, stiff wrists, excess force and pressure on instrument keys, strings or bow, slumped posture, neck tension, ulnar deviation, elevated left shoulder in violinists, twisted posture, wrist hyper-flexion, proximal muscle weakness, restricted range of body and arm movement and tense hand grip (Wynn Parry 2003:323).

Proximal postural issues may cause distal upper extremity symptoms, hence the need to be aware of whole-body biomechanics (Melton 2009; Brandfonbrener 2006:750; Shafer-Crane 2006:829). Fatigue in static postures starts a cycle of compromised movement patterns. It has also been shown that dynamic postures are less injurious than static postures and that by maintaining small-scale movements, less restrictive muscle tension is built up (Kenny & Ackermann 2009:391).

Psychosocial risk factors for the development of PRMDs include depression, anxiety, internal or external pressures on the individual, personal and professional stress, social phobia and personality characteristics, such as perfectionism and somatisation (Chan & Ackermann 2014:3). According to Brandfonbrener (2001:24), stress is the most individually variable risk factor. Constant striving for perfection, fierce

competition, high levels of anxiety, and fluctuating employment all contribute to the development of musicians' health issues (Rosset-Llobet et al. 2000:167). Physical and psychological risk factors function interactively (Guptill 2011b:269; Ackermann 2010:248; Brandfonbrener 2010:29). Psychological stress leads to increased muscle tension, which means that psychosocial issues contribute to physical playing-related symptoms (Rietveld 2013:431; Zander, Voltmer & Spahn 2010:54; Levy, Lounsbury & Kent 2009:138; Akel & Düger 2007:149). In discussing how psychological stress has a profound effect on a musician's overall health, Ackermann (2010:248) affirms succinctly that "physical and psychological stressors act synergistically to produce a negative reciprocal effect on injury and music performance anxiety".

Kenny and Ackermann (2013:15) found that the severity of PRMDs was directly linked to the severity of MPA, suggesting that "PRMD may not be able to be treated effectively without considering the observed relationships between PRMD, depression and MPA". Similarly, Salmon, Shook, Lombart and Berenson (1995:140) investigated performance stress factors and their contribution to both psychological and physical disorders, finding that the fewest PRMDs and the lowest MPA were reported by those who scored highest in stress hardiness. Both physical and psychosocial work factors were associated with neck and shoulder pain in a large survey of Swedish music teachers (Fjellman-Wiklund, Brulin & Sundelin 2003:40). The inseparability of the mind and body must not be overlooked as "disturbances of physical function can have profound emotional effects, and disturbances of emotion can have profound bodily and artistic effects" (Rosen, Heuer, Sasso & Sataloff 2010:355).

Having presented an overview of the prevalence and risk factors for musicians' PRHPs, each of the following four sections will comprise the literature on musicians' neuromusculoskeletal health, hearing conservation, and vocal and psychological health. These four categories are the four distinct musicians' health areas for prevention, intervention and education as defined by the Health Promotion in Schools of Music (HPSM) conference (Palac 2008:20).

2.5 NEUROMUSCULOSKELETAL DISORDERS

This section on neuromusculoskeletal disorders will begin with an outline of the types of PRMDs. As the instrument itself is a risk factor, the occurrence of PRMDs in specific instrumental groups will be addressed. This will be followed by SA research on PRMD and an overview of PRMD rehabilitation. The majority of PRMDs affect the upper limbs, neck and back regions (Chan, Driscoll & Ackermann 2014:181; Rietveld 2013:431; Sheibani-Rad, Wolfe & Jupiter 2013:146; Kenny & Ackermann 2009:390; Guptill & Golem 2008:307). Neuromusculoskeletal problems in musicians can be grouped into three categories: pain and musculoskeletal overuse, entrapment neuropathies, and focal dystonias (Dommerholt 2009:312; Barton et al. 2008:73; Foxman & Burgel 2006:310).

2.5.1 Pain and Musculoskeletal Overuse

Pain is the most common symptom described by musicians seeking treatment (Sheibani-Rad, Wolfe & Jupiter 2013:146; Schaefer & Speier 2012:317; Hoppmann 2010:211; Barton et al. 2008:73; Foxman & Burgel 2006:310). Other frequent symptoms are weakness, reduced range of motion, tingling, numbness and loss of control (Hansen & Reed 2006:790). An extensive review by Silva, Lã and Afreixo (2015) confirmed the high prevalence of musicians' pain: lifetime prevalence of pain affecting playing facility was approximately 85%, and one-year prevalence was 54%. Regarding severity, Fry (1986c:728) developed a standard injury severity grading scale which is widely used:

> *Grade 1*: Pain in one site on causal activity.
> *Grade 2*: Pain in multiple sites on causal activity.
> *Grade 3*: Pain with some other uses of the hand, tender structures demonstrable, may show pain at rest or loss of muscle function.
> *Grade 4*: Pain with all uses of the hand, post activity pain with minor uses, pain at rest and at night, marked physical signs of tenderness, loss of motor function (loss of response or control), weakness.
> *Grade 5*: Loss of capacity for use because of pain which is continuous, loss of muscle function, particularly weakness, gross physical signs.

Hoppmann (2010:211) modified Fry's severity scale, including the duration and effect of the pain:

> *Grade 1*: Pain while playing or for a short period after playing.
> *Grade 2*: Pain that persists for a longer period (hours) after playing.
> *Grade 3*: Pain that progresses while playing and requires the practice session to be shortened but resolves between sessions.
> *Grade 4*: Pain that progresses while playing and does not totally resolve between sessions.
> *Grade 5*: Continuous pain that markedly reduces or prevents playing.

Pain, fatigue, stiffness and weakness are all part of a cluster of symptoms described under the umbrella term 'overuse' (Sheibani-Rad et al. 2013:147; Rosenbaum et al. 2012:1270; Schaefer & Speier 2012:317; Cebriá I Iranzo et al. 2010:95; Hansen & Reed 2006:791). 'Overuse syndrome' is often used very broadly, though not without controversy, due to the different interpretations thereof (Bird 2013a). Cebriá I Iranzo and colleagues (2010) recommend that unambiguous definitions of specific PRMDs are necessary. Similarly, Winspur (2003) and Brandfonbrener (2001) caution against imprecise terms, advocating more specific, pathological diagnoses.

In a recent paper by Rickert, Barrett and Ackermann (2014a:99), they explain overuse comprehensively:

> The majority of playing-related injuries in orchestral musicians are related to overuse or misuse of body structures, whereby muscles, tendons, ligaments, and joint capsules are damaged or worn (microtrauma) faster than the body is able to repair them (cumulative trauma). Pain is the body's way of indicating that damage has occurred and naturally acts as an incentive to cease injurious activities. When musicians choose to play on with pain, they risk damaging already injured structures. When this behaviour is allowed to continue, it can lead to chronic injuries.

Preferred terms in certain cases are 'musculoskeletal pain syndrome' or 'regional pain syndrome' (Hoppmann 2010; Lederman 2002). Several other terms are also used to label overuse, such as cumulative trauma disorder (CTD) and repetitive strain injury (RSI), all of which describe the pain and inflammation caused by the tissues being stressed beyond their limits. Rietveld (2013:434) explains that RSI is not a diagnosis but a descriptive expression which is useful in occupational medicine. As fatigued, overused muscles exhaust their endurance capacity, efficiency decreases and more

force is required for the same activity, causing further fatigue and tension, and the cycle continues, with increasing pain and decreasing results (Cebriá I Iranzo et al. 2010:98).

Overuse causes several types of musculotendinous problems, including ligament sprain, tenosynovitis, tendinitis, epicondylitis, shoulder impingement, rotator cuff syndrome, and arthritic conditions (Kenny & Ackermann 2009:390; Lederman 2003:551).

2.5.2 Entrapment Neuropathies

Peripheral nerves may be affected by compression, entrapment or irritation anywhere along their course (Rietveld & Leijnse 2013:482). The terms ‘compression’ and ‘entrapment’ are often used interchangeably in the literature on peripheral neuropathies (Lederman 2010:61). According to Lederman (2003:552), entrapment neuropathies are defined as “disorders of peripheral nerve function associated with a lesion at a predictable anatomical site at which the nerve is subject to compression, stretch, or friction”.

Many musicians are affected by entrapments of the median nerve, ulnar nerve, or the thoracic outlet, having pain, weakness, and sensory symptoms, such as tingling, numbness or burning (Lederman 2010:61). Symptoms, which can be intermittent, often present only whilst playing, and there is loss of dexterity and control, yet nerve conduction studies may be normal (Rosenbaum, Vanderzanden, Morse & Uhl 2012:1271). Entrapment neuropathies tend to follow instrument-specific patterns, with keyboard players being affected in the right arm and hand, upper string players in the left arm, and clarinet and oboe players being more susceptible in the right arm and hand (Lederman 2006:762).

Musicians’ nerve compression disorders are related to aspects, such as sustained awkward playing positions, sustained muscle contraction or pressure from supporting the instrument (Kenny & Ackermann 2009:391). Carpal tunnel syndrome (median

nerve compression at the wrist) is the most common entrapment neuropathy in musicians, followed by ulnar nerve compression at the cubital tunnel at the elbow, and others such as thoracic outlet syndrome, where there is neurovascular compression between the collarbone and first rib (Sheibani-Rad et al. 2013:147; Lederman 2010:63; Kenny & Ackermann 2009:391).

2.5.3 Focal Dystonias

Musicians' focal dystonia (FD) is a central nervous system disorder with sensory input and motor output disruptions causing dysfunctional movement (Kenny & Ackermann 2009:391). The loss of voluntary motor control affects a part of the body carrying out complex and highly-trained movements (Rosset-Llobet, Fabregas-Molas & Pascual-Leone 2012:1236; Jabusch & Altenmüller 2006:207). Frucht (2009:137) refers to FD as "a corruption of complex, motor programs that have already been acquired". FD has affected notable musicians, such as Robert Schumann, Leon Fleischer and Pinchas Zukerman, as well as approximately 1% of professional musicians (Rietveld & Leijnse 2013:481; Rosenbaum et al. 2012:1271; Altenmüller 2009:9).

FD presents as loss of fine motor control of the hand, fingers, arm, lips, tongue, jaw, embouchure, larynx or foot (Furuya & Altenmüller 2015:120; Lederman 2010:67). The task-specific symptoms include painless involuntary muscle spasms, impaired control, co-contractions, tremors, flexion or extension, and loss of strength (Furuya & Altenmüller 2015:120; Rietveld & Leijnse 2013:481). Muscle strain due to compensatory patterns can cause discomfort such as tightness and aching (Altenmüller, Ioannou & Lee 2015:94; Schaefer & Speier 2012:320).

A definitive cause of FD is unclear; however, prolonged repetition of movement and overuse are always involved. Moreover, FD is aggravated by biomechanical factors, such as tension and rigidity (Lederman 2010:68; Kenny & Ackermann 2009:391; De Lisle, Speedy, Thompson & Maurice 2006:105). Genetic predisposition is an associated factor (Furuya & Altenmüller 2015:118; Sadnicka, Wiestler & Kassavetis 2013:19; Rietveld & Leijnse 2013:483; Rosenbaum et al. 2012:1271).

The neurological aspects involved in FD are abnormal sensorimotor integration, deficient inhibition and dysfunctional plasticity (Chang & Frucht 2013:43; Aránguiz, Chana-Cuevas, Farias 2012:55; Alburquerque & León 2011:47; Lin & Hallett 2009:109; Jabusch & Altenmüller 2006:212). The brain's adaptation to new tasks, as musicians learn and improve skills, is called plasticity. The changes seen in the somatosensory cortex of musicians with FD are believed to stem from maladaptive brain plasticity (Rosset-Llobet, Fàbregas-Molas & Pascual-Leone 2014:16; Chang & Frucht 2013:43; Farias 2012:103; Altenmüller 2009:9). There is a loss of neuromuscular ability to regulate agonist and antagonist actions (Tubiana 2003a:303). This co-contraction of antagonist muscle groups is a significant characteristic of dystonic symptoms, together with 'overflow' contractions in adjacent muscles (Altenmüller, Ioannou & Lee 2015:93) and a fusion of representational areas in the somatosensory cortex (Konczak & Abbruzzese 2013:3; Rietveld & Leijnse 2013:483).

The underlying generalised somatosensory dysfunction cannot be overlooked because symptoms include disturbed sensorimotor integration and diminished tactile and proprioceptive perception (Konczak & Abbruzzese 2013:3). Proprioceptive deficit eventually causes loss of voluntary motor control, explaining why sensorimotor retraining has had long-term results in reducing focal hand dystonia symptoms (Konczak & Abbruzzese 2013:1).

The link between movement, emotion and psychological functioning plays a role in the development of FD (Altenmüller 2003a:532). Behavioural mechanisms include perfectionism and anxiety (Ioannou, Furuya & Altenmüller 2016:227; Lederman 2010:68) due to "triggering an emotion-dependent mechanism of motor memory consolidation of dystonic movements" (Jabusch & Altenmüller 2006: 212). The personality type most susceptible to FD is highly motivated, enthusiastic, perfectionistic and ambitious, and classical musicians are more affected than other genres (Jabusch & Altenmüller 2006:207; Altenmüller 2003a:531). Prevention is crucial when considering the challenges related to the treatment of FD. Therefore, the education of young musicians should foster positive emotional experiences, confidence-building performance psychology, and healthy musical practice.

Expectations of musical performance should be corrected, “replacing the fascination of mere perfection and virtuosity by the joy of emotional communication shared with the audience and the musicians” (Altenmüller & Jabusch 2009:153).

The three categories of neuromusculoskeletal disorders in musicians were presented: pain and musculoskeletal overuse, entrapment neuropathies, and focal dystonias. The next four sections will examine the literature on PRMD, specifically among string players, pianists and keyboard players, woodwind and brass musicians and, lastly, percussionists.

2.5.4 Research on Performance-Related Musculoskeletal Disorders in String Players

Research has shown a range of 65% to 88% lifetime prevalence of overuse-type injuries in violinists (Ackermann & Adams 2004b:669). Upper string players frequently experience symptoms in the neck, shoulder, wrist and hand (Lahme, Eibl & Reichl 2014:241; Lee, Park, Yoon, Kim, Chun, Aminata, Cho & Jeon 2013:156; Wynn Parry 2003:321). Double bass players most commonly report back pain (Lee et al. 2013:156). Moore, De Haan, Ehrenberg, Gross and Magembe (2008:155) found that 70% of the college-age violin and viola players they assessed reported pain in the upper limb, with the left shoulder more affected than the right. Rickert, Barrett, Halaki, Driscoll and Ackermann (2012:65) documented that 20% of the student cellists and 42% of the professional cellists in their study had current shoulder injuries.

Postural problems in student violinists were evaluated, examining technique and postural corrections, and highlighting the need for preventative postural exercise programmes (Barczyk-Pawelec, Sipko, Demczuk-Wlodarczyk & Boczar 2012; De Araújo, Gatto Cardia, Másculo & Gomes Lucena 2009). Ackermann and Adams (2003) emphasise that the physical setup on the violin must be given proper attention in teaching, together with instrument and bow size. Violinists with varying body types can play very successfully, yet there is an interaction between physical characteristics and

other factors, such as positioning, technique and muscle tension that must be well monitored.

Spahn, Wasmer, Eickhoff and Nusseck (2014) highlight the relevance of violinists' different playing positions for imbalance, possible physiological strain, and contribution to the development of PRMDs. Sitting caused significantly less freedom of movement in the upper body, and sitting compared to standing was physiologically more challenging, particularly sitting oriented to the right of the music stand compared to being the left desk partner. Castleman (2002) discussed the most common causes of PRMDs in violists, emphasising collaboration of the medical practitioner and the music teacher during rehabilitation, and establishing the most 'natural' fit between player and instrument. Palac (1992) analysed violin bowing technique pedagogies, offering guidelines for teachers regarding bowing as an action involving the whole body, including technical aspects of bowing, and focusing on bowing movement analysis rather than an approach which prescribes form.

According to Steinmetz, Ridder and Reichelt (2006:188), the prevalence of craniomandibular dysfunction (CMD) symptoms was increased in violinists. Similarly, Lozano, Yuguero and Fenoll (2008:12) reported a significantly higher occurrence of bruxism in professional violinists compared to controls. Lacraru (2014) explored knowledge and practices of upper string instrument support, discussing customisation strategies for chin and shoulder rest design, together with balanced posture. Obata and Kinoshita (2012:2085) determined that violinists' chin force was increased during louder playing, when playing four-note chords, during vibrato, whilst shifting, and when playing a technically-demanding violin concerto. Rabuffetti, Converti, Boccardi and Ferrarin (2005:58) measured the effects of different shoulder rest set-ups on the posture and movement of violinists, using surface electromyography (EMG), an optoelectronic system, and biomechanical models, which facilitated movement calculations of the upper body, violin and bow, providing "movement analysis methodology as a tool to support the violin setup process" (Rabuffetti et al. 2005:66).

Kelleher, Campbell and Dickey (2013) reviewed quantitative research on upper extremity, shoulder and neck biomechanics in string players that used mostly EMG, kinematics and motion analysis. They found that violinists were the most commonly studied, while double bass players were hardly studied. Gaps in existing research were identified, relating to examining the mechanisms of injury and exploring preventative strategies, noting that current research in arts biomechanics is predominantly descriptive. Berque and Gray (2002) used surface EMG to measure muscle activity in the upper trapezius muscles of viola and violin players, suggesting the potential of using EMG biofeedback as both a preventative and therapeutic measure to reduce neck-shoulder pain in violin and viola players. Fjellman-Wiklund, Grip, Karlsson and Sundelin (2004:347) used EMG to evaluate trapezius muscle activity patterns in string players, mostly violinists, and found that there was considerable variability among the players due to the different playing techniques. Using surface EMG, Park, Kwon, Ha, Kim, Choi and Weon (2012:188) found that violinists' asymmetrical playing posture elevates the superficial muscle activity, which contributes to musculoskeletal disorders and restricts range of movement (ROM) in the neck. Shan, Visentin and Schultz (2004) used multidimensional signal analysis (MSA) to better understand PRMDs in violinists and describe their movements more accurately. MSA allows for the combination of multiple observational methods, integrating externally observable data with physiological data. Grosshauser and Tröster (2014) developed unobtrusive finger position and pressure measurement sensors for string instruments, integrated into the violin or guitar fingerboard, which have numerous possibilities when linked with interactive software.

PRMD lifetime prevalence among guitarists of diverse musical genres has been documented as 81% (Fjellman-Wiklund & Chesky 2006:169) and 75% (Marques, Rosset-Llobet, Marques, Gurgel & Augusto 2003:11), with a 12-month prevalence of 61% reported by Rigg, Marrinan and Thomas (2003:150). The fretting hand was most susceptible (Fjellman-Wiklund & Chesky 2006:169; Rigg et al. 2003:150). Palaiokastriti (2013:61) studied the various playing positions and supports used by guitarists, and examined lateral deviations, finding that PRMD risk could be reduced

by means of good guitar technique, good body fitness, regular practice breaks, and altering guitar positions.

This section reviewed the literature on the PRMDs of string players, including guitarists. The discussion now focuses on the research on PRMDs among keyboard instrumentalists.

2.5.5 Research on Performance-Related Musculoskeletal Disorders in Pianists and Keyboard Players

The prevalence of PRMDs in pianists had been measured in several studies, reporting lifetime prevalence of 41% (Wood 2014:44), 59% (Pak & Chesky 2001:22), and 26% (Shields & Dockrell 2000:159). A PRMD point prevalence of 38% was documented by Bruno, Lorusso and L'abbate (2008:855). Measuring playing-related pain, Yoshimura (2009:i) found a prevalence rate of 86% in a sample of college students and 91% in a sample of piano teachers.

According to Pak and Chesky (2001:22), the age group 10-20 years was the most affected. Moreover, females were significantly more at risk, and the highest prevalence was in the right wrist. Shields and Dockrell (2000:159) state that although pain was the most common symptom and the wrist the most frequently reported site, they found no significant difference with regard to prevalence between genders. Wood (2014:44) also found that pain was the most frequent symptom, with the forearm the most common location. The prevalence of PRMD was highest in those aged 21-30, and lowest in those over 35 years of age. This was probably due to the dropout phenomenon, as well as the ability of older musicians to learn coping strategies. Bruno, Lorusso and L'abbate (2008:855) reported that factors associated with PRMD among piano students were total playing duration, lack of breaks in practice, low exercise levels, and a belief in 'no pain, no gain'. According to Wood (2014:44), lower rates of PRMD were associated with participation in exercise.

At least one strenuous technique (such as double octaves, chords or fortissimo) was associated with pain in 73% of pianists (Shields & Dockrell 2000:159). Similarly, Sakai (2002:178) reported that the onset of symptoms often coincided with practising techniques, such as octaves and chords with extreme hand stretches. Sakai (2008:169) studied keyboard span in keyboard instruments and states that “many modern pianists struggle with difficult piano techniques on a modern keyboard, which is broader than the old type that the 18th- and 19th-century composers used”. Smaller hand size was a risk factor in a study by Yoshimura (2009:i), who found that the modified narrower keyboard allowed smaller-handed pianists to avoid maximum hand stretches and to play with reduced tension and pain. Wristen, Jung, Wismer and Hallbeck (2006:8) examined smaller-handed pianists’ use of the 7/8 keyboard, showing that it was beneficial in that measurements, such as joint angle and force loading were reduced.

Regarding treatment, Wood (2014:44) found that just under half of their jazz pianist participants were treated by a medical professional, whilst alternative treatment was sought by 65% of the pianists, with the AT, exercise, and meditation reported by the majority as being most beneficial. Wristen (2000:63) investigated the biomechanics of piano technique, outlining an approach that can be successfully utilised for injury prevention, based on integrated and coordinated movement patterns, biomechanically sound principles, ergonomic awareness, kinaesthetic learning, tension release, acknowledging individual and environmental variables, and avoiding rigid prescriptive instruction.

Ferrario, Macrì, Biffi, Pollice and Sforza (2007:18) analysed hand and finger movement patterns in pianists, using motion analysis. The researchers suggest that extraneous hand and finger movement patterns could be further studied to investigate their correlation with overuse injuries and to develop piano pedagogy to reduce the risk of PRMDs in pianists. MacRitchie (2015:4) reviewed the literature investigating the measurement of biomechanics at the piano, specifically concerning “objective evaluation that allows pianists to discover the mechanisms behind the act of touch”.

Riley, Coons and Marcarian (2005:87) investigated the use of multimodal biofeedback tools which help pianists develop awareness of aspects, such as muscle tension, body alignment, sound, and technical movements. Musical instrument digital interface (MIDI) technology recording and playback, video recording and motion analysis, and surface EMG can be effective diagnostic and rehabilitative tools. Riley et al. (2005:87) assert that “healthy technique, as demonstrated by many professional pianists, involves the ability to relax immediately after depressing the key, thereby making the tension-relaxation cycle more reliable”. Trouli, Bird and Riley (2013:611) studied the use of MIDI recording, video postural analysis, and surface EMG to assess the biomechanics of playing in pianists with existing clinical conditions in the upper limbs, to aid rehabilitation. Clemente, Lourenço, Coimbra, Silva, Gabriel & Pinho (2014:150) studied the head and cervical posture of pianists while playing to understand muscular activation in the cranio-cervico-mandibular complex (CCMC).

Alford and Szanto (1996:30) discuss traditional piano pedagogical practices, stating that “it is difficult to challenge teaching maxims that lead to discomfort. Instead, musicians in pain blame themselves”. They argue that responsibility is not being taken: “The medical world could blame pain on misuse; the virtuoso world on lack of genius or hard work; the pedagogical world on bad teaching or lack of talent (Alford & Szanto 1996:30). Likewise, Yoshimura (2009:44) discusses the need for more objective data and scientific research to verify the approaches to piano pedagogy that promote wellness. Surveying piano students, Ling, Loo and Hamedon (2016:201) found that about half of the respondents believed that pain was normal, and just over half believed that pain was necessary for improvement, highlighting the critical need for education on PRMD risk factors and prevention.

2.5.6 Research on Performance-Related Musculoskeletal Disorders in Woodwind and Brass Players

In a large survey of woodwind and brass instrumentalists from military bands, 50% of the players had PRMDs. The most common symptom was pain, followed by stiffness

and numbness. Females and oboe, clarinet and flute players were the most frequently affected (Nemoto & Arino 2007:67).

Most tertiary student flautists studied by Halliwell (2014) had experienced at least one episode of pain within the last year; preventative awareness was minimal; and the left arm was more susceptible than the right. Ackermann, Kenny and Fortune (2011) found that almost all of the advanced tertiary flute players in their study, who were otherwise healthy and exercised regularly, suffered from PRMD, and in about two-thirds, PRMD had been present for longer than three months. The most frequent symptom was pain, followed by tingling, numbness and weakness. None of the students had consulted a medical doctor for their PRMDs (Ackermann, Kenny & Fortune 2011:255). Among flute players internationally, the point prevalence of PRMD was 27% and the lifetime prevalence 50% (Lonsdale, Laakso & Tomlinson 2014). The most common locations of pain were the fingers, hands, arms, neck, middle and upper back, and shoulders. The respondents reported a need for flute teachers and ensemble directors to teach correct posture as it was frequently neglected. Participants had not received injury prevention information during their studies and advocated strongly for preventative programmes and training during music education. De Oliveira Teixeira, Lã and Da Silva (2013:148) also recommend that strategies for managing the physical and mental demands of playing should be taught in musical curricula. They found that neck pain related to playing was reported by most of the flautists in their study. Student flautists were more susceptible, while older professional flautists were far less affected, which may be explained by the ‘healthy worker effect’.

McIlwain (2010) found that 83% of the student clarinetists surveyed experienced pain or discomfort whilst playing. Excruciating pain was reported by 8% of the participants. Numbness was reported by 37%, most commonly in the right thumb. A playing-related injury diagnosis occurred in 21%, most frequently tendinitis, then carpal tunnel syndrome, and then temporomandibular joint syndrome. In clarinetists, pain is often caused by prolonged stress in the right hand and wrist, particularly in the thumb (Cabrera, Moroz, Ma & Lee 2001:162; Chesky, Kondraske & Rubin 2000:775). Chesky and colleagues (2000:776) found that using an elasticised clarinet neck strap

significantly decreased the forces and the force angles and may therefore reduce the risk of injury. McIlwain (2010) discusses the reduction of strain on the right thumb and hand by employing the much larger and stronger muscles of the arm and back, as well as the use of a neck strap. Similarly, the right thumb of oboists is also statically loaded as it bears weight, stabilises the instrument, and assists in the upward force towards the mouth (Thrasher & Chesky 2001:159). Female oboists were more at risk and the right upper limb was the most common PRMD site. The most common non-musculoskeletal problems were headaches, blackouts/dizziness and MPA (Thrasher & Chesky 2001:157). Hahnengress and Böning (2010) found that the changes in exertion during professional clarinet playing may cause some cardiopulmonary strain but were not pathophysiological. More advanced players developed improved breath control and endurance. The heart rate increased to a level similar to moderate or heavy physical exercise dependant on difficulties encountered in the playing, respiratory changes and emotion.

The bassoon can be played whilst sitting or standing and there are different support methods, such as neck straps, shoulder harnesses, leg rest, seat strap and floor peg (Dawson 2015; Brusky 2009). PRMD symptoms were experienced by 86% of bassoonist study participants (Brusky 2009:81). A medically-diagnosed condition was reported by 31%, with tendinitis being the most common condition, including, among others, carpal tunnel syndrome, nerve compression in the neck or back, thoracic outlet syndrome, temporomandibular joint disorder and muscle imbalance. The most common symptom was pain (78%), followed by tingling, numbness and loss of dexterity, with 75% of players continuing to play whilst injured. Female bassoonists were more affected than males (Brusky 2009:81). Thrasher and Chesky (2001:157) found that bassoonists were most susceptible to PRMD of the left wrist, left hand, left fingers and right wrist. Headaches, eye strain and fatigue were the most prevalent non-musculoskeletal problems. Dawson (2012:107) notes that bassoonists' PRMD risk factors include female gender, small body size and younger age.

Woldendorp, Boschma and Boonstra (2016) researched and assessed functional and dysfunctional brass players' embouchures, stating that "a transparent and theoretically

sound foundation for embouchure is clearly lacking, and this is hampering educational, artistic, and therapeutic effectiveness", noting the many "unproven beliefs" of tone production (Woldendorp et al. 2016: 233). They proposed an improved definition for embouchure:

> Embouchure is the process needed to adjust the amount, pressure, and direction of the air flow (generated by the breath support) as it travels through the mouth cavity and between the lips, by the position and/or movements of the tongue, teeth, jaws, cheeks, and lips, to produce a tone in a wind instrument (Woldendorp et al. 2016: 232).

Chesky, Devroop and Ford (2002:93) demonstrated that 60% of the tertiary brass players in their study reported PRMD. Trombonists had the highest prevalence of PRMD, followed by French horn, then low brass, and then trumpet. Moreover, it was found that females were more affected than males. Headache, blackout or dizziness, and loss of lip control were most prevalent in trumpet and French horn musicians due to higher pitch demands and increased intraoral pressure and mouthpiece force. Stage fright was also more prevalent in French horn and trumpet players (Chesky et al. 2002:95). The strong mouthpiece forces in trumpeters increases the risk for PRMDs such as rupture of orbicularis oris, tooth displacement, embouchure dystonia, head and neck lesions, and temporomandibular joint and jaw pain (Devroop & Chesky 2002:149).

Stasney, Beaver and Rodriguez (2003:155) also found that the highest hypo-pharyngeal pressures were required in the French horn and the trumpet, and advised that the correct teaching of technical aspects such as proper posture is essential. Better physiological efficiency was measured in expert professional trumpet players when comparing students to professionals in a study on cardiac response during trumpet playing, showing that physiological adaptation occurs (Robertson, Federoff & Eisensmith 2010:16). Potter, Johnson, Johnson & Vandam (2015:90) found that trumpet players had greater facial strength and endurance, cheek strength and lip endurance than the controls in their study. In French horn players, musculoskeletal problems were more prevalent on the left side of the body as the left arm and hand maintain the horn in playing position, operate the valves and hold the horn firmly on the embouchure (Chesky, Devroop & Ford 2002:95). Iltis, Frahm, Voit, Joseph,

Schoonderwaldt and Altenmüller (2015) studied fast tonguing movements in elite French horn players during playing, using magnetic resonance imaging (MRI). Similarly, Iltis, Schoonderwaldt, Zhang, Frahm and Altenmüller (2015:132) utilised MRI to compare the playing movements within the oropharyngeal cavity of a trumpet, French horn, trombone, and tuba player.

In trombonists, musculoskeletal problems were more prevalent on the left side of the body due to the weight of the instrument being supported by the left hand and arm (Price & Watson 2011:317; Chesky, Devroop & Ford 2002:95). Wallace, Klinge and Chesky (2016:87) surveyed playing-related pain in trombonists and found a one-year prevalence of 76.6%. The specific site with the highest pain prevalence was the lip, with the severity being mild for most respondents, but severe in 10%. This is significant as lip pain may be a warning symptom of embouchure dysfunction.

Evans, Ackermann and Driscoll (2009:267) discuss velopharyngeal insufficiency (VPI), a condition in which the soft palate does not close and air escapes through the nose whilst blowing through the mouth due to prolonged exposure to high intraoral pressure, manifesting mostly with oboe, bassoon, clarinet, trumpet and French horn (Evans, Driscoll & Ackermann 2013:657). The estimated prevalence of VPI in musicians ranges from 17% to 39%. The causes of VPI are multifactorial so multidisciplinary treatment needs to be individualised (Evans, Driscoll, Livesey, Fitzsimons & Ackermann 2015:52).

Ackermann, O'Dwyer and Halaki (2014:7) found significant differences between sitting and standing postures in the mechanisms of breathing and support in wind instrument players. The musicians preferred playing in standing positions, which resulted in almost double the activation of both the upper and lower abdominal muscles compared to that in sitting positions. Borkowski (2011:51) assessed whether physical fitness affected flute performance. There was no significant difference in terms of standard repertoire but in repertoire with more challenging respiratory requirements, the effect of cardiovascular training was beneficial.

2.5.7 Research on Performance-Related Musculoskeletal Disorders in Percussionists

Sandell, Frykman, Chesky and Fjellman-Wiklund (2009:175) examined self-reported PRMD and stress-related health problems in percussionists. One or more PRMDs were reported by 77% of the percussionists, with the highest prevalence (89%) among the keyboard percussionists, such as xylophone, marimba and vibraphone. Both hands and lower back were the most frequently reported site of PRMD. Moderate to high stress levels were associated with PRMD, and the main stress-related problems were stage-fright, depression and fatigue.

Papandreou and Vervainioti (2010:116) determined that percussionists' PRMDs affected the upper limbs, followed by the spine. Lee and Altenmüller (2014:174) reported on a rare case of task-specific musician's dystonia in the right thigh of a professional heavy-metal drummer aged 28. Rosset-Llobet et al. (2012:1236) reported on two cases of musician's dystonia in the lower limb in drummers: a jazz percussion student, aged 23, who had been diagnosed with dystonia in the left foot and ankle; and a semi-professional rock drummer, aged 22, who had developed dystonia in both feet and ankles.

Having examined the international PRMD prevalence research in specific instrument categories, I will now review the SA literature on PRMD in musicians in general. This will facilitate the process of drawing comparisons between prevalence data, and shed light on the volume and types of research on musicians' PRMD that have been generated in SA.

2.5.8 South African Research on Performance-Related Musculoskeletal Disorders in Musicians

A small number of research studies contribute to the body of knowledge relating to musicians' playing-related musculoskeletal health in South Africa. Seven studies refer to the prevalence of playing-related musculoskeletal conditions in varying musical

populations. A pedagogical emphasis is found in four of the research papers; there is one study on a vocalist's health condition; and one on hearing health.

Thaele (2016:v) found that the lifetime prevalence of PRMDs among Western art music student instrumentalists at a SA university was 88.8% and the point prevalence 46.3%. Roughly half of the participants had consulted health professionals, stating that they had gained temporary relief but minimal long-term benefit. About half of the students had PRMDs that were severe (3/5 or higher) and had an impact on their ability to play optimally. Approximately one third of the PRMDs had lasted for a week, whereas about 20% had lasted for more than two years. Most participants had very little awareness or knowledge of somatic practices. Thaele (2016:80) concluded that prevention is imperative and that "there is a need for more effective management of these problems from the students, teachers and the institution". Thaele (2016:81) therefore recommends education in prevention, treatment and management of musicians' health problems in the first two years of undergraduate study. Movement awareness methods should be embedded in the curriculum, and interdisciplinary networks between performing arts, sports science and medical faculties should be established. Music institutions must create a more open and accepting environment for supporting students' health and well-being.

Ajidahun and Phillips (2013:97) found that 82% of teachers and students surveyed at a university performing arts centre in SA reported having experienced PRMD in the previous 12 months. The point prevalence was 24%. The severity of pain was mostly mild, and the upper limb, specifically the shoulder, was most commonly affected. Ajidahun, Mudzi, Myezwa and Wood (2017:6) documented that the prevalence of PRMD among string players from amateur and professional orchestras surveyed in South Africa was 77%, while at the time of the study, 35% were experiencing PRMD. Ajidahun, Mudzi, Myezwa and Wood (2016:1) researched upper extremity disability among professional and amateur orchestral string instrumentalists in SA and found that the lifetime prevalence of MSI was 57%.

A study by Barnes, Attwood, Blom, Jankielsohn, Janse van Rensburg, Smith, Van Ede and Nel (2011:41) found that 84% of a sample of SA orchestral musicians experienced PRMD, but that almost half of them did not do anything about their symptoms. The researchers identified a need for prevention strategies, including education and early management of injuries. The Alexander Technique (AT) combined with physiotherapy treatment is recommended, and the need for research into posture, physical condition and muscle endurance in musicians is highlighted.

Hohls (2010:v) found a PRMD point prevalence of 63% in a sample of professional string orchestral musicians in SA. These high rates of PRMD prevalence results are in line with similar studies internationally, but the treatments prescribed by medical professionals are not. An additional finding was related to severe financial stress combined with psychological strain in the musicians, many of whom needed to do additional work to supplement their earnings. Hohls (2010:124) notes the lack of both research in SA and awareness and knowledge among professional musicians, as well as the need for preventative programmes at tertiary level, and the education of medical professionals.

Van der Walt (2006) found that all instrumental university music student participants in her study reported physical problems, ranging from stiffness, aches and pains, to more serious injuries. She notes the role of lecturers as the primary source of information and guidance for their students in terms of prevention and treatment. Michels (2004) investigated MSI in musicians, which was either caused or aggravated by playing. She outlines the MSI associated with specific instruments and highlights the importance of prevention in terms of education, exercise, healthy practice methods, and heeding pain as the body's warning signal.

Mennen (1999) wrote about PRMD in musicians, referring to lifestyle, nutrition, musculoskeletal efficiency and awareness, balanced posture, physical exercise, warm-ups, stretches, and practicing methods, as essential parts of a general preventative approach. Medical diagnosis should consider the inter-relationship between physiological and psychological factors. He advocates for a "holistic team

approach to the management of specific health problems in musicians" (Mennen 1999:21).

Rhoodie (2004) proposes an overview of an approach to piano teaching for younger pupils with awareness of posture, tension release, and coordinated free movement. Bennell (2004) investigated left-hand technique in violin pedagogy, from the viewpoint of allowing for optimal movement as well as technical skill and freedom, and preventing occupational injury. She discusses physiological processes, such as the use of a balanced posture and sensorimotor development to facilitate the fine motor skills of the left hand. Roos (2001b) studied violin pedagogy, emphasising freedom of movement, balanced posture and the release of tension. Approaches such as the AT are discussed, as well as breathing awareness, relaxation activities, practice habits and lifestyle. Roos (2001a) describes the beneficial effects of improved alignment in violinists and explains several group class activities for teaching balanced postural use while playing the violin. Foale (2006) wrote a critical analysis of violin bowing technique, studying posture, balance and efficiency of movement. Digital motion-tracking was used to compare linear and non-linear bowing styles. Findings reveal that posture, balance and flexibility were integral for efficiency of the bow-arm technique, and that non-linear bowing styles were more energy efficient, resulting in protection from PRMD as well as improved endurance.

Ajidahun (2011) devised a warm-up programme for instrumentalists at a university performing arts centre in South Africa as an intervention to reduce the prevalence of PRMDs, noting that the programme should be used in conjunction with other prevention aspects, such as proper playing techniques, postural awareness, taking breaks, reducing repetition, and pacing. Du Plessis (2012) studied diaphragmatic-intercostal breathing and the occurrence of gastroesophageal reflux disease (GERD) in singers. Her study suggests a relationship between breathing techniques and GERD, and provides information for vocal teachers to be able to assist students with the disorder and to understand the various medical treatment options, including lifestyle changes. Schutte (2002) investigated the effect of playing wind instruments on the instrumentalist's hearing, finding that all participants had a decrease in hearing

sensitivity in the higher frequencies and that those who played louder instruments, such as the trumpet, had more damage to their hearing. Flute and piccolo players demonstrated more damage in their right ears.

This review indicates that the literature on PRMD in South African musicians demonstrates prevalence data in line with international research, with lifetime prevalence rates of PRMD ranging from roughly 60% to 88%, and point prevalence figures ranging from 24% to 63%. However, the volume of research is very small and focuses on Western art music. There is a clear need for further study in the local context and among a broader range of musical levels and genres.

In order to gain a better understanding of the prevention of PRMDs, it is necessary to understand their rehabilitation and glean relevant information which may also be applicable to injury prevention education. It is therefore appropriate to conclude this section with an overview of the literature on the rehabilitation of PRMDs.

2.5.9 Rehabilitation of Performance-Related Musculoskeletal Disorders

A multidisciplinary team approach in the rehabilitation of the musician-patient is widely recommended (Schaefer & Speier 2012:321; Ackermann 2010:248; Brandfonbrener 2006:752). This is well-illustrated by Steinmetz, Seidel and Niemier (2008) who documented an injured violinist's rehabilitation in which they analysed movement and postural habits, instrumental posture and muscular imbalances. The medical treatment, together with physiotherapy, a personalised exercise programme, instrument set-up corrections, and technical improvements facilitated the violinist's complete recovery.

Ackermann (2010:267) states that good communication between health professionals, musicians, music students, parents, teachers and music administrators is therefore vital. For example, Ackermann and Adams (2004a:9) found that health professionals who need to analyse a violinist's movement should work with a violin teacher who is experienced in observing violin technique. The ergonomic and postural requirements

of each instrument must be studied as most playing-related health problems of musicians are neuromusculoskeletal (Dommerholt 2010a:66). Graded slow rehabilitation, movement and posture retraining, and gradual return to play are only possible when facilitated with support from the educational and work environment (Ackermann 2010:248; Hansen & Reed 2006:792).

Early diagnosis, taking comprehensive histories, thorough physical examination and correct treatment are essential. The musician-patient must be assessed while playing to observe posture, excess tension, movements, instrumental demands, and the symptoms of the disorder and their effects on playing.[13] The literature shows that only 4% of musicians' hand and arm problems require surgery. Although the issue may be focal, the musician should be treated holistically by means of various non-invasive treatments in addition to surgery (Winspur & Warrington 2010:230). In many cases, musicians' hand and arm surgery is due to accidental injury unrelated to their occupation. The surgeon needs to consider the musician's special needs, and the surgery must be accompanied by a comprehensive rehabilitative programme (Sheibani-Rad, Wolfe & Jupiter 2013:149).

There are two treatment phases, namely acute and rehabilitative. The former involves rest (absolute or relative), while the latter includes exercises and gradual return to normal playing (Sheibani-Rad et al. 2013:147; Rosenbaum et al. 2012:1270; Schaefer & Speier 2012:317; Schuele & Lederman 2004:125). Relative rest is suggested where possible rather than complete rest which may cause further anxiety, depression, diminished confidence and loss of skill (Rietveld 2013:431; Schaefer & Speier 2012:321; Hansen & Reed 2006:792). Ackermann (2010:248) proposes the following essential factors for rehabilitation interventions:

> Education; assessing and retraining postural faults; identifying and correcting biomechanical flaws; retraining appropriate motor control strategies; addressing muscle

[13] Rietveld (2013:431); Sheibani-Rad, Wolfe and Jupiter (2013:147); Rosenbaum et al. (2012:1269); Schaefer and Speier (2012:317); Dommerholt (2010a:65); Dommerholt (2009:314); Hansen and Reed (2006:792); Lederman (2003:551).

> conditioning and flexibility; applying therapeutic interventions; ergonomic applications; introducing music-specific skills and return-to-play considerations; injury prevention for musicians.

Physiotherapy interventions and exercise programmes are effective in terms of treating and managing PRMD (Damian & Zalpour 2011:211; Kava, Larson, Stiller & Maher 2010:18). Strengthening, stretching and endurance exercises, cardiovascular fitness, biomechanically-efficient technique and postural training are imperative (Kava et al. 2010; Rardin 2007). McCrary, Halaki, Sorkin and Ackermann (2016:307) evaluated the effects of cardiovascular, core muscle and musical warm-ups on the performance of skilled violinists, demonstrating a significantly decreased rate of perceived exertion (RPE). A PRMD prevention programme at the orchestra of the Teatro alla Scala in Milan showed that early intervention enabled musicians to return to work sooner. Data gathered from clinical evaluations over 14 years of the programme found that poor posture was the main risk factor (Spotti, Tamborlani & Converti 2008:137). Similarly, three other studies found that customised orchestral musicians' exercise programmes were beneficial with regard to several measurement criteria, including reducing PRMD rates (Chan, Driscoll & Ackermann 2014:181; Sarda, Araolaza, Rumbau & Vilaró 2005:1; De Greef, van Wijck, Reynders, Toussaint & Hesseling 2003:156).

Non-invasive treatments, such as splinting, taping, ultrasound, ice, heat, massage, exercises, trigger point therapy, joint mobilisation, and medication are beneficial (Rietveld 2013:431; Kenny & Ackermann 2009:392). In addition, upper limb condition treatment comprises posture correction, strengthening exercises for the intrinsic hand muscles as well as for shoulder and scapular stabilisers, endurance training in muscles requiring static use, and education on the biomechanics of joints and movement (Rietveld 2013:431; Schaefer & Speier 2012:321). Yet, Ackermann, Adams and Marshall (2002b:197) found that short-term scapula taping did not enhance proximal scapular stability and muscular efficiency in violinists during playing and that the perceived effects on playing were negative. Specific treatment options for hypermobility-related conditions include avoiding inappropriate stretching, modifying activities that increase strain on hypermobile joints, improving stability through

strengthening, and dynamic splinting (Sheibani-Rad, Wolfe & Jupiter 2013:149; Schaefer & Speier 2012:318).

In addition to medical treatments for entrapment neuropathies (such as medication, injection, splinting, or surgical decompression), Lederman (2006:773) suggests postural and technique corrections, instrument modifications, stress management skills, reducing muscular tension, therapeutic exercises and orthotics. Schaefer and Speier (2012:319) recommend decreased playing time, posture correction, instrument adaptation, nerve glide exercises, resting splints, and the AT or FM for body awareness and minimising tension.

Successful treatment of musicians' focal dystonia (FD) is challenging (Altenmüller, Ioannou & Lee 2015:101; Chang & Frucht 2013:45; Hansen & Reed 2006:794). Rehabilitation options have variable results and include sensory and proprioceptive re-training; body awareness, tension-reducing and relaxation techniques; task-specific motor-control exercises; splinting/constraint-induced therapy; physiotherapy; occupational therapy; technical re-training; postural and ergonomic awareness; exercise; 'sensory tricks'; psychotherapy; biofeedback; botulinum toxin (BT) injections; beta blockers; and anticholinergic medications (Van Vugt, Boullet, Jabusch & Altenmüller 2014:8; Chang & Frucht 2013:45; Frucht 2009:139). The injection of BT may be effective in some cases, but the symptomatic efficacy thereof depends on the dystonic pattern, the injection technique and the exact localisation of the dystonic muscles (Altenmüller, Ioannou & Lee 2015:101; Jabusch & Altenmüller 2006:214). In embouchure dystonia (ED), treatment with BT was not satisfactory (Schuele, Jabusch, Lederman & Altenmüller 2005:342). Lie-Nemeth (2006:781) confirms that rest alone does not help. Practising 'harder' in the same way will worsen the symptoms (Rietveld et al. 2013:451; Schaefer & Speier 2012:321).

The main goal of rehabilitation should be to create a 'new sensorimotor programme' (Altenmüller 2003a:534; Tubiana 2003a:307). Retraining based on stimulating proprioception is beneficial (Rietveld et al. 2013:451; Farias 2012). Many patients with FD also have postural and muscle imbalance problems, emphasising the need for both

peripheral and whole-body movement retraining, with efficient and free movement, and proprioceptive awareness (Chamagne 2003:312; Tubiana 2003b:307). De Lisle et al. (2006:110) found that movement, posture, and technical retraining together with awareness of sound improved biomechanics and reduced tension in pianists with FD because the best sound correlated with the best biomechanical movement quality. Byl, Archer and Mckenzie (2009) demonstrated that a comprehensive home programme of sensory discrimination rehabilitation was beneficial in the treatment of FD. 'Slow-down exercise' (SDE) was a structured retraining programme for pianists with FD, which was shown to be very effective (Sakai 2006). Constraint-induced movement therapy (splint immobilisation) is beneficial to the rehabilitation of focal hand dystonia as it enables cortical separation and normalised sensorimotor representations, and produces long-term results (Furuya & Altenmüller 2015:120; Berque, Gray & McFadyen 2013:33; Rosset-Llobet and Fàbregas-Molas 2011:106; Berque, Gray, Harkness & McFadyen 2010:160).

Somatic approaches, such as the Alexander Technique (AT), the Feldenkrais Method (FM) and yoga have been beneficial to musicians in the prevention and rehabilitation of PRMD as they teach improved awareness of muscle tension, movement efficiency and body position in everyday and musical activities (Hoppmann 2010:215; Rardin 2007). McIlwain (2010:38) discusses the alternative therapists that musicians seek and who are often perceived as being more understanding of musicians' needs. Such therapists include osteopaths, chiropractors, naturopaths, massage therapists and reflexologists. Brodsky and Hui (2004:170), who investigated the combination of complementary medicine and conventional medical treatment to treat musicians, found that a patient-centred comprehensive approach that considered the whole person and drew from different traditions of medicine was very effective.

Psychological support is an essential part of the management and treatment of musicians' PRMDs (Hoppmann 2010:216; Kenny & Ackermann 2009:393; Foxman & Burgel 2006:311). Palac and Grimshaw (2006:889) explain the components of clinicians' holistic therapeutic relationship with musicians, such as validation, safety, being heard, taking the necessary time, understanding the problem, appropriate

referral, and collaborating with other health practitioners. A biopsychosocial rather than a biomedical treatment approach is recommended so that physical and psychological problems are not viewed separately (Kok et al. 2013; Guptill 2008; Guptill & Golem 2008; Hansen & Reed 2006:789; Spahn, Richter & Zschocke 2002). As Brandfonbrener (2010:29) states, “care must involve the ‘whole’ person”.

This section has described neuromusculoskeletal disorders in musicians and examined the different types of PRMD, the research on PRMD with regard to particular instrumental categories, South African literature relating to musicians’ PRMD, and the rehabilitation of PRMD. An important category of musicians’ occupational health will now be addressed: the research on musicians’ hearing health.

2.6 HEARING HEALTH

Musicians have highly-specialised occupational hearing needs, yet the musical environment presents noise hazards (Sataloff, Sataloff & Hawkshaw 2010:92). Musicians’ unique auditory requirements present a challenge to the prevailing model of occupation-related hearing loss, requiring simultaneous protection and optimal use (Henoch & Chesky 1999:79). Chesky (2006:44) confronts another challenge faced in broadening the awareness of noise-induced hearing loss (NIHL), namely the potential conflict between the promotion of music education in schools and the acknowledgment and disclosure of NIHL as an associated risk. Manchester (2010:1) comments that hearing damage is “a largely invisible problem” due to the absence of disclosure by high-profile celebrity musicians with regard to hearing loss, which would publicise the issue.

NIHL is caused by excess sound exposure in performance and practice (Sataloff et al. 2010:93; Pride & Cunningham 2005:135). It is permanent and irreversible, and to prevent it, the daily sound level exposure should not exceed a time-weighted average (TWA) of 85 decibels (dB) over 8 hours. Both the decibel level and the duration of exposure are relevant so that for every 3dB increase time exposure must be halved

(Dick et al. 2013:398). These limits are specified by the USA National Institute for Occupational Safety and Health (NIOSH) (Barlow 2010:177). Similar regulations are followed by most countries in Europe and several provinces in Canada (Behar, Macdonald, Lee, Cui, Kunov & Wong 2004:244).

2.6.1 Prevalence of Hearing Problems in Musicians

Musicians of all genres are highly susceptible to occupation-related hearing damage, including NIHL, difficulty in pitch discrimination, and tinnitus (Sataloff, Sataloff & Hawkshaw 2010:98). An estimated 50% of musicians experience NIHL (Dick et al. 2013:398). Schink, Kreutz, Busch, Pigeot and Ahrens (2014:1) researched the incidence of hearing problems among professional musicians (acoustic and electronic instruments) compared to the general population in a cohort study of three million German citizens. The musicians were nearly four times more likely to develop NIHL and 57% were more likely to develop tinnitus than the general population. Kähäri, Zachau, Eklöf and Möller (2004:627) determined that 74% of rock/jazz musicians suffered from various hearing disorders, most commonly hearing loss, tinnitus and hyperacusis. McIlvaine, Stewart and Anderson (2012:31) observed that rock band musicians were exposed to excessively high noise levels and doses and that they should be educated in hearing conservation. Chesky and Henoch (2000:35) found that rock, alternative and R&B musicians reported the highest percentage of NIHL, followed by jazz and blues musicians, and then music teachers. Schmidt and colleagues (2011:893) showed that instrument and repertoire type are significant factors for NIHL and that classical musicians are at risk primarily from their own instrument.

Orchestral musicians are frequently exposed to sound levels exceeding their national action levels (Laitinen 2005:21). Ackermann, Kenny, O'Brien and Driscoll (2014) found that 43% of the orchestral musicians in their study reported hearing loss. Musical theatre orchestra pits are often confined spaces, exacerbating the sound level issue (Morton 2015:6). Orchestral musicians' risk for hearing loss is due to accumulated sound exposure from individual practice, teaching activities, rehearsals and

performances (O'Brien, Driscoll & Ackermann 2013:2748; Lee, Behar, Kunov & Wong 2005:928). In a study by Toppila, Koskinen and Pyykkö (2011:49), it was discovered that orchestral musicians' measurements of hearing loss were similar to the non-exposed population, but that there was an elevated presence of tinnitus (ringing in the ears) and hyperacusis (an increased sensitivity to sound), both of which can be precursors of hearing damage. Similarly, Zander, Spahn and Richter (2008) state that roughly 16% of their orchestral participants reported tinnitus and severe hearing loss at high frequencies had a prevalence rate of 17.5%.

Lee et al. (2005:927) attribute some of the contradictory results obtained in different studies to the fact that total exposure over a certain period of time is not always considered. Zander, Spahn and Richter (2008:14) comment on research inconsistencies, noting the need for more than one measurement point to ascertain "the progression of audiometrically established impairment across time". O'Brien and Beach (2016:132) found that band and orchestral musicians had different behaviours regarding the use of hearing protection, and highlighted the diversity of attitudes, requirements and knowledge.

Most music teachers exceed the maximum limit of safe weekly total noise exposure during their teaching activities, resulting in potential risk of NIHL (Maffei, Iannace & Masullo 2011:9; Behar et al. 2004:243). Similarly, Hayes (2013:54) and Owens (2004:109) demonstrated that high school band directors, with their accumulated teaching and ensemble activities, experienced an overall noise dosage that was far greater than that specified in the NIOSH guidelines. The acoustic environment was the most significant variable for reducing sound pressure levels (Hayes 2013:54).

Hoffman, Cunningham and Lorenz (2006:47) found that percussionists' hearing thresholds were significantly worse than those of the control group. Nearly all percussionists surveyed by Curk and Cunningham (2006:61) knew about the permanence of NIHL and that only certain earplugs are effective for percussionists, yet showed poor use of hearing protection and had not had hearing assessments. After a brief hearing conservation programme, 77% started wearing musician-

appropriate earplugs. Prevention compliance improvement indicated that such education programmes would potentially reduce NIHL among percussionists.

It is therefore logical to examine the research on hearing issues among tertiary student musicians before investigating hearing conservation education among that population.

2.6.2 Research on Student Musicians' Risk for Hearing Problems

Studies have documented that music students are exposed to daily doses exceeding prescribed safety standards due to the cumulative exposure to sound from all musical activities and personal listening devices.[14] Olson et al. (2016:29) state that more than one third of their student musician respondents reported tinnitus, while 12% reported a history of hearing loss. Most of the students had never received any instruction in hearing health, and most did not use hearing protection, describing the negative effect on sound quality as the main reason. In the same vein, Zeigler and Taylor (2001:143) found that more than half of the university music students surveyed reported tinnitus, which can be associated with the onset of NIHL. Rubinstein, Cherry and Bader (2013:34) found that tertiary music students and lecturers displayed a lack of knowledge about excess sound exposure. Very few students and staff regularly used ear protection. Most of the students and staff were supportive of the need for education in hearing conservation in music training programmes.

Barlow (2010:180) surveyed the potential risk of NIHL in tertiary students studying popular and commercial music, and examined their study-related, leisure and social music activities. Symptoms associated with hearing loss were reported by 76% of the students, and only 18% reported using hearing protection. Although the reported level of awareness and education was moderately high, compliance was low. Barlow (2011:96) investigated NIHL in students studying popular music, music technology and

[14] Olson, Gooding, Shikoh and Graf (2016:29); Callahan, Lass, Foster, Poe, Steinberg and Duffe (2012:43); Walter (2009:63); Miller, Stewart and Lehman (2007:160); Henoch and Chesky (2000:17).

sound engineering. A reduced hearing threshold at one or more frequencies was evident in 44% of the participants, while 16% exhibited mild hearing loss according to the UK Occupational Health and Safety guidelines, and about half of the sample had some reduction of hearing in at least one ear. The occurrence of NIHL was much higher than in the general population but was similar to data on classical music students.

The risk of NIHL and associated hearing problems is well documented and the prevalence statistics are alarming. The question therefore arises as to what needs to be done about it. The literature on hearing conservation recommendations is therefore the subject of the following section.

2.6.3 Hearing Conservation Recommendations

Callahan and colleagues (2012:42) suggest implementing hearing conservation programmes, conducting regular audiometric assessments, bringing about environmental modifications, limiting exposure time and changing the location of certain instruments in the ensemble. Music students who had participated in a NIHL education programme showed improved knowledge about hearing loss and hearing protection, therefore supporting the need for these types of interventions, including regular audiometric evaluations. However, the students displayed negative perceptions regarding the wearing of hearing-protection gear (Callahan et al. 2012:50). Heale (2013:42) maintains that a change in young people's perception of wearing earplugs is necessary. Although awareness of hearing conservation among students may have improved, the concept of reducing the volume rarely occurs. In rehearsals, gigs and clubs, the danger to students' hearing has become a critical issue.

Chesky, Pair, Yoshimura and Landford (2009:661) argue that recommendations for the use of earplugs should only be made once all other sound-controlling measures have been investigated and further comprehensive research on the consequences of earplug use has been done. Huttunen, Sivonen and Pöykkö (2011:176) showed that

despite using special musicians' earplugs, orchestral musicians encountered difficulties with regard to the occlusion effect and hearing their own playing, especially the perception of timbre, nuances and dynamics. Zander, Spahn and Richter (2008) reported that although more than 80% of the orchestral players knew about custom-moulded hearing protectors, only about 10% of the musicians, mainly percussionists, use them. Hearing protectors were not used preventatively but rather as a reaction to symptoms or situations that had strained their hearing (Zander et al. 2008:25). The implementation of hearing conservation programmes for orchestral musicians has been shown to be effective in terms of reducing the risk of hearing loss (Zander et al. 2008:25; Laitinen 2005:21; Lee et al. 2005:929).

Santucci (2009:104) outlines five parts of a hearing conservation intervention: "sound level survey; audiometric monitoring; education and motivation; reducing level of exposure through environmental controls; hearing protection devices". Chasin (1998:14) describes several environmental aspects: speakers should be elevated above the floor or tilted upwards; brass instruments should be placed on risers; a space should be maintained in front of the band or orchestra on stage; and the upper strings should not be seated under overhangs; and baffles on the back of chairs may be effective when used correctly.

Barlow (2010:181) highlights the legal implications for educational institutions that may not be adequately protecting their students according to occupational noise legislation. Chesky (2010:29) describes how university wind bands with safer sound exposure did so by means of improved management of dynamic levels. The knowledge and attitudes of the band conductor, as well as the responsibilities of educational institutions are therefore important (Chesky 2010:33). In addition, Hayes (2013:61) recommends training for music educators in the use of teaching and conducting techniques which reduce noise exposure. Educating performers, teachers, conductors and administrators in hearing conservation and audiometric testing is imperative (Dick et al. 2013:398).

Chesky, Pair, Yoshimura and Landford (2009:661) evaluated tertiary music students' use of musicians' earplugs. Low rates with regard to the use of earplugs by musicians, including those that are custom-fitted and have an even response, is the norm. The use of earplugs was found to be challenging as the musicians reported discomfort, impaired verbal communication, problems hearing themselves and others play, difficulty communicating musically, and a perceived negative impact on playing. Wind players had a heightened negative response due to the occlusion effect and increased oral sounds such as tonguing. Miller, Stewart and Lehman (2007:160) found that although most of the student musicians they surveyed had hearing conservation knowledge, less than a third used hearing protection and their use was inconsistent, and almost two-thirds of the students reported having tinnitus.

Chesky (2008:38) points out that music-related NIHL is preventable through education, yet there is a lack of hearing conservation education at schools and universities. A common misconception is the focus on the sound level only instead of a combination of the level and duration of exposure. Tertiary music students are routinely involved with several ensembles, individual practice, and sound-related activities, all contributing to total exposure. Music teachers, particularly ensemble directors, may be the most suitable for educating their students (Chesky 2008:38). Chesky (2006:46-8) outlines the UNT model where ensemble directors are educated in hearing conservation and the tertiary music ensemble setting is used to promote an awareness of NIHL.

In light of these considerations, education on hearing conservation is critical for tertiary level student musicians. It should therefore be included in occupational health interventions. The third significant health promotion area concerns vocal health which will now be addressed.

2.7 VOCAL HEALTH

Singers are different from instrumentalists in that their 'instrument' is within their bodies. They need to be aware of how the vocal mechanism changes with age, and how aspects, such as vocal range, type of repertoire, vocal technique, self-care and medical care can affect their vocal health and endurance (Brandfonbrener 2010:31). Music teachers also sustain elevated vocal load due to the extensive speaking and singing aspects of their work, and proactive voice care knowledge is required (Morrow & Connor 2011:446; Hackworth 2007:27).

2.7.1 Maintenance of Vocal Health

Vocal abuse and misuse occur because of incorrect technique and vocal strain. Voice lessons given by an experienced teacher are an extremely important part of voice care and ensure optimal technique (Sataloff & Hawkshaw 2010:134). Caring for the emerging adolescent voice is important and Lee, Pennington and Stemple (1998:167) found that singing the lead in a high school musical was not detrimental when supported by private formal voice training.

Common medical conditions of the vocal cords are nodules, polyps, haemorrhage and oedema, which are usually related to voice abuse or misuse. The voice may sound hoarse and breathy or have a lower pitch (Sataloff & Hawkshaw 2010). Jahn (2009:5) describes vocal nodules as follows:

> Vocal nodules are an occupational disorder, the result of inadequate technique, excessive singing, or a mismatch between the singer's physical and technical abilities and the vocal task. They are more commonly seen in women with higher voices and in pop singers. A particularly vulnerable group is children or teenagers singing popular music.

Treatment for nodules includes voice therapy and vocal technique retraining. If surgery is indicated, vocal retraining is necessary to correct the causal technical problems. Vocal haemorrhage is sudden and painless and complete vocal rest is necessary for successful healing (Jahn 2009). In vocalists, common upper respiratory tract

conditions need to be treated more intensively to alleviate symptoms as ongoing coughing and throat clearing are damaging to the vocal cords, and vocal use should be adjusted to avoid forcing, vocal strain and tension (Sataloff & Hawkshaw 2010; Jahn 2009). Absolute or relative voice rest is always an important part of treatment (Sataloff & Hawkshaw 2010). Side effects of asthma and allergy medication should be considered such as the drying effect of antihistamines (Sataloff & Hawkshaw 2010; Jahn 2009). According to Sataloff and Hawkshaw (2010), hormonal problems in singers are a concern as the voice is very sensitive to endocrine fluctuations. Hearing loss can also cause vocal problems because the loss of accurate auditory feedback interferes with the vocal control mechanisms. Another common problem is gastroesophageal reflux which causes inflammation and irritation in the larynx.

Sataloff and Hawkshaw (2010:133) describe a multidisciplinary medical management team for voice problems. Stress, anxiety and depression are often associated with vocal dysfunction (Rosen et al. 2010:363; Sataloff & Hawkshaw 2010:140; Jahn 2009:8). Jahn (2009:4) therefore points out that anyone working with singers should take the whole person into account: “As with other areas of performing arts medicine, it is important to keep in mind that a singer is not a disembodied set of vocal folds, but a complete physical and mental entity who happens to sing for a living”.

2.7.2 Research on Vocal Use and Injury Prevention

In a national survey of singing teachers, 21% of the respondents reported a current vocal problem, while almost two-thirds had experienced one in the past (Miller & Verdolini 1995:351). Research shows that over half of student singers report a current voice problem and that they experience heavy vocal load from singing-related activities required for their studies and non-singing voice use such as loud talking in social environments. These, together with lifestyle habits, nutritional choices, smoking and frequent throat clearing are common causes of vocal injury. Research shows that although professional singers claim to be knowledgeable about vocal health, evidence suggests that they are relatively uninformed. A course on vocal health promotion and

injury prevention for student singers was shown to be beneficial (Ziegler & Johns 2012:536).

Contemporary commercial vocalists' awareness of voice care behaviours and access to treatment was studied by Gilman, Merati, Klein, Hapner and Johns (2009:225). The authors describe the need for education in vocal health for these singers and access to affordable and appropriate treatment as vocal disorders are often ignored, resulting in long-term detrimental effects. Erickson (2012:19) investigated the vocal use of traditional and popular singers (including folk, rock, country, bluegrass, blues, jazz, world, pop and gospel singers). While approximately one third of the singers had some voice training, most of the respondents reported that they had not received any advice about maintaining vocal health. At least once in their professional career, roughly one third of the singers had suffered total voice loss or lost their top range. About half of the singers never or rarely warm up prior to performing, and most play an instrument while singing, which affects their singing and posture. Most of the respondents had not consulted a professional (medical or voice) when experiencing vocal problems.

As professional voice users, teachers, particularly music teachers, also require knowledge of potential vocal damage from speaking. According to Nerrière, Vercambre, Gilbert and Kovess-Masféty (2009:375), voice problems in teachers are frequent, with half of female teachers, and one in four male teachers reporting voice disorders, and music and singing teachers being noticeably more at risk. Hackworth (2007:21) discusses the fact that school music educators would benefit from education in voice care during their training due to extensive occupational use of the voice for both speaking and singing. Similarly, Morrow and Connor (2011:446) maintain that music teachers need preventative voice care knowledge as research shows that compared to other teachers, they are four times more at risk of vocal strain and damage because of their very high vocal load.

Hawkshaw, Pebdani and Sataloff (2013:486) reviewed current research on laryngopharyngeal reflux (LPR) in singers, which is a form of gastroesophageal reflux disease (GERD), and found that there is still a great deal of controversy surrounding

its pathophysiology, diagnostic criteria and treatment. According to Jahn (2009:7) and LaPine (2006:758), LPR and GERD need to be treated with medication, as well as diet and lifestyle changes.

Sandgren (2002:18) explored the interaction between psychological and physiological aspects in professional opera singers, and found a high dependence on vocal functioning: “When the vocal ability failed, both women and men felt inadequate and worthless not only in their professional identities, but also in their private personas”. Perfectionism and fear of criticism negatively impacted identity and self-esteem. With increased anxiety, somatic symptoms caused emotional distress and preoccupation with physical health.

Bowes (2009) researched the use of imagery by professional classical singers to achieve optimal performance. A sports psychology theoretical framework was applied, combined with prior research on the use of imagery in musicians and perspectives from psychology on imagery. Particularly relevant to this study are her findings on the use of the senses in imagery as “Singers’ imagery primarily involved sight, auditory, and kinaesthetic senses which were considered to be intrinsic to vocal performance” (Bowes 2009:299). She comments on the importance of this for music education, which had previously been based more on visual and aural learning, with later integration of the kinaesthetic sense.

Although vocalists often use the terms ‘diaphragm’ and ‘support’ synonymously, breath support is a combination of abdominal, back, rib and thoracic muscle activity (Thorpe, Cala, Chapman & Davis 2001:103). This notion is supported by Sataloff, Cohn and Hawkshaw (2010:197) who assert that “the diaphragm is an inspiratory muscle, of course, and represents only a portion of the support mechanism”. General fitness and body condition are an important part of optimal voice use and health (Sataloff & Hawkshaw 2010:139). Whole-body awareness and balanced posture are essential, as Melton (2009:433) states: “When the abdominal/pelvic core is overlooked, the actor/singer works without a foundation, and activity in the upper body (shoulders, chest, neck and head) frequently attempts to compensate for a lack of

awareness and use of the lower torso". Optimal and efficient breathing is imperative in performance for all musicians as it allows for the release of physical tension and freer muscular coordination. Specifically, in vocalists, the movement of breath is the basis of sound in that it creates the vibration of the vocal cords (Lee et al. 2012:86).

Having presented a brief review of the research on vocal health, the fourth and final health promotion area, namely psychological health, will be presented in the next section.

2.8 PSYCHOLOGICAL HEALTH

Although the psychological aspects of musicians' occupational health cannot be viewed in isolation from the physiological factors, it is valuable to conduct a focused review, beginning with the psychosocial and environmental factors of the music profession.

2.8.1 Musicians' Psychosocial and Work Environment

Professional musicians' well-being, viewed from the perspective of Positive Psychology, was explored by Ascenso, Williamon and Perkins (2017). Several components of musicians' well-being emerged, such as meaningful musical experiences resulting in positive emotions and engagement, the role of meaning related to self-concept and identity, relationships in both work and personal environments, accomplishment associated with personal goals, and freedom of expression. Intrinsically, music is a highly-rewarding profession, yet psychosocial aspects, including job/study satisfaction, self-worth, values, fears, aspirations and self-identity need to be considered (Hoppmann 2010:211; Park, Guptill & Sumsion 2007:94). Potential occupational stressors include factors, such as maintaining skills at a high level, solitary repetitive practice, constant self-evaluation and public scrutiny, along with an erratic schedule, frequent travel, touring and financial insecurity (Kenny & Ackermann 2009:393). Vervainioti and Alexopoulos (2015:197) defined seven broad

categories of interrelated stressors: public exposure, personal hazards, repertoire, competition, job context, injury/illness and criticism.

Psychosocial stress factors in orchestras, such as low autonomy, unsupportive management styles, regular live performances, external locus of control and funding difficulties were explained by Rickert, Barrett and Ackermann (2013:226). Kenny, Driscoll and Ackermann (2012:2010) investigated psychological well-being in orchestral musicians and "identified a significant pattern of anxiety, depression and health behaviours that require attention in occupational health and safety policies and programmes for this workforce". Prescribed and non-prescribed medication and alcohol were frequently utilised. Beta blockers were used by 30% of musicians, many without prescription and on a regular basis (Kenny et al. 2012:229).

According to Harper (2002), professional classical musicians highlighted problems associated with musculoskeletal issues (such as cramped playing position and poor seating), noise and hearing, and stress, particularly relating to financial insecurity. Confinement, lack of cleanliness, noise, poor ventilation and often dangerous conditions in orchestral pits were described. One participant who described an inability to cope physically, wrote: "I wasn't informed as a student or young professional that I should strengthen up to avoid muscle imbalance … Unfortunately, when I eventually received the right treatment to help me, too much long-term damage had been done" (Harper 2002:84). Although most of the musicians had used various approaches to minimise the problems, these were only somewhat helpful. The freelance musicians were in a particularly weak and vulnerable position as they feared losing work if they spoke out or tried to improve their poor working conditions (Harper 2002:91).

Levine and Levine (1996:18) investigated lack of control as the primary cause of the high stress levels experienced by orchestral musicians, with the omnipotent conductor as "maestro" in the traditional patriarchal orchestral hierarchy. Similarly, Johansson and Theorell (2003:147) state that orchestral musicians are highly qualified, but seldom have authority with regard to artistic choices. Work content, artistic quality,

social support, and influence/control were associated with health and well-being among orchestral players.

Freelance popular musicians also experience “stigma and devaluation” of their profession (Vaag, Giæver & Bjerkeset 2014:206). Vaag and colleagues (2014:205) state that “an unpredictable future, threats to the family/work balance and significant amounts of external pressure were three broad contextual demands”. According to Hernandez, Russo and Schneider (2009), the challenges faced by members of a rock band included anxiety, depression, family disruptions, control issues and the lack of psychological support. Similarly, Raeburn (1999:176) highlights the psychosocial challenges experienced by popular musicians, such as chronic job insecurity, stress from lack of recognition, ‘feast or famine’ work schedules, technical difficulties, artistic and commercial discord, “peer pressure to develop bad health habits; age discrimination in the industry; and lack of privacy”. Celebrity musicians faced psychological and artistic identity issues related to the commercialisation of their music, and continual pressures of practising, performing, writing, recording, promoting and touring. Job security was a major challenge since ‘downward slides’ happened as quickly as overnight success stories. Gruelling tour schedules and conditions, along with disrupted sleep, different time zones, nutritional issues, ongoing publicity events, separation from spouses and family, relationship issues among members of the touring group, and frustration as a result of the repetition of the same material were also experienced (Raeburn 1999:177).

Raeburn (2000) identifies the high levels of alcohol and drug abuse among popular musicians, as well as depression, anxiety and suicide. Substance abuse, such as alcohol and drug abuse, among artists may be more ‘tolerated’ in the artistic and performance environment (Brandfonbrener 1997b:47). Tolson and Cuyjet (2007:537) studied substance abuse among jazz musicians, and found that for most, it had a negative impact on their careers. Chesky and Hipple (1999:193) investigated musicians’ perceptions of drug use among musicians and found that about one third were of the opinion that there was widespread drug use among musicians, with

younger and male musicians, and non-classical musicians reporting more use. This raises concerns and highlights the fact that prevention education is imperative.

Musicians are emotionally invested in their performance, and there is a correlation between stress and physiological and psychological problems respectively (Kenny 2011:164). Not only are symptoms of anxiety and depression prevalent, but many also perceive their work as stressful, which leads to increased muscle tension, a cause of MSI (Rickert et al. 2013:221). Kenny and Ackermann (2013) assessed the relationships between psychological factors and pain in orchestral musicians, and discovered a significant association between the severity of PRMD and depression and MPA respectively. However, there was also a group who "denied depression but reported the most severe pain, suggesting a group who somatize their psychological distress" (Kenny & Ackermann 2013:43).

According to Rickert, Barrett and Ackermann (2013:219), elevated stress in the orchestra was a risk factor for injury. The researchers suggest that musicians who are in pain may not stop playing or request assistance for fear of real or perceived disapproval from colleagues, and recommend equipping musicians with stress coping mechanisms and conflict resolution skills, and creating a broader "positive and supportive organisational culture". They maintain that "apart from the health benefits, such interventions may also lead to stronger balance sheets" as research has shown that "increased social support and the presence of a supportive group culture leads to lower levels of physical and psychological injury and increased productivity" (Rickert et al. 2013: 227). Rickert, Barrett and Ackermann (2014a:94) explored the impact of 'orchestral culture' on injury risk in the orchestral profession. Injury was viewed as indicating weakness and being associated with failure, poor technique, or weak musicianship. These negative perceptions surrounding injury caused behavioural responses, such as playing through pain, continued performing whilst injured, injury concealment, embarrassment, shame, self-blame and guilt. Freelance musicians feared losing work after disclosing injuries. The researchers emphasise the need for a shift towards healthier organisational values in orchestras, stating that:

> …a healthy workplace means more than the mitigation of physical and psychological injury risk. What it requires is a shift of company values so that employee health and well-being becomes a central part of the way orchestras set goals and appraise success (Rickert et al. 2014a:100).

Dobson (2010) explored autonomy, self-expression, experiences of freelance work, and well-being in young professional classical and jazz musicians. Financial and job security was an issue, and maintaining reputations within freelance musician networks was necessary, as was the demand for continuously having to prove themselves. Peer competition, peer networking, and professional socialising to improve job opportunities were common, with frequent alcohol consumption associated with performance pressure, social expectations, and the availability of alcohol in performance locations (Dobson 2011). Participants also reported experiencing difficulties related to insecurities about their abilities and reputations, and a "tension between camaraderie and competition" at music colleges (Dobson 2011:252).

According to Ascenso et al. (2017:65), students found the transition into becoming a professional challenging, and holistic educational programmes to develop the whole person are needed (Ascenso et al. 2017:65). Chesky and Devroop (2003:77) suggest that prevention interventions "should consider the role of college instruction to help young musicians understand and prepare for the economic realities of the musician workplace". Dobson (2010:57) advocates professional skills training at conservatories, including the skills needed to manage a 'portfolio' career and a freelance lifestyle.

Successful musicians develop various effective adaptive coping skills, depending on their psychological characteristics (Kenny & Ackermann 2009:394). Orchestral musicians demonstrated the use of positive coping strategies, such as "increased practice, deep breathing and other relaxation techniques, positive self-talk, and mock performance practice, among others" (Kenny et al. 2012:230). Vaag, Giæver and Bjerkeset (2014:205) determined that the three main protective factors associated with good mental health among freelance popular musicians, and which are also referred to in resilience research, were personal temperament, family coherence and social resources. The challenges were managed through family, collegial, and audience support, together with personal characteristics, such as "entrepreneurial skills, value-

anchored flexibility, tolerance for ambiguity and dedication to music making" (Vaag et al. 2014:205). Raeburn (2000) advocates a multifaceted biopsychosocial approach that considers the individual, the band, the family and the broader music industry culture. Organisations in the USA, such as MusiCares and the SIMS (Services Invested in Musician Support) foundation are examples of bodies that have been established, with goals such as awareness, a culture of recovery, changing the image of therapy, addressing addiction and supporting musicians' medical needs (Raeburn 2000:15).

Tuisku, Houni, Seppanen and Virtanen (2016) explored significant associations between more stable working conditions and improved psychosocial and occupational well-being in a large and diverse sample of creative artists in Finland. Factors associated with work stability included an established career with experience, motivation, resilience, inspiration, creativity and work engagement. Tuisku and colleagues (2016:109) conclude that the "stable employment of artists would offer the optimal frames for mental well-being essential for flourishing art production", and "the possibility to integrate artistic and creative methods into other fields of society and working life, such as education, economy, and the social and welfare sector".

The debatable issue of performers being more 'emotional' or 'sensitive' is probably linked to their professional artistry (Brandfonbrener 1997b:47). Wills (2003) explored the link between psychopathology and creativity among a group of eminent jazz musicians, suggesting an interesting association between creativity and sensation-seeking, although the study had several limitations. Dobson (2011:240) reminds us that much of the literature linking creativity and psychopathology is derived from questionable retrospective biographical research. In their extensive study on anxiety and depression symptoms in Norwegian professional musicians, Vaag, Bjørngaard and Bjerkeset (2016:244) found that psychological distress levels were higher in musicians than in non-musicians.

Brandfonbrener (2004:152) identifies the crux of the psychological challenges faced by performing artists in that:

> Ultimately there is no question that every time a professional artist performs, the artist is in fact putting his or her feelings up for public approval or disapproval, but one hopes that with maturity and self-assurance, a professional musician can better tolerate this kind of assault than a younger, less mature one.

Anxiety associated with performance is therefore a prominent topic included in the research on the psychological health and well-being of musicians. Variable terminology, such as ‘performance anxiety’, ‘stage fright’ or ‘performance stress’ has been used. The following section will examine what is typically referred to as ‘music performance anxiety’.

2.8.2 Music Performance Anxiety

Research presents a variety of findings about music performance anxiety (MPA), but the overall realisation is that it is ubiquitous and can be severe (Sasso 2010:319). Great artists, such as Maria Callas, Enrico Caruso, Pablo Casals, Luciano Pavarotti, Vladimir Horowitz, Arthur Rubenstein and Sergei Rachmaninoff (Kenny 2011:1), as well as Barbra Streisand and John Lennon (Lehman, Sloboda & Woody 2007:146) suffered from MPA. The 1988 ICSOM survey revealed that “stage fright” was the most severe and frequently experienced non-musculoskeletal problem (Fishbein et al. 1988:6). Van Kemenade, Van Son and Van Heesch (1995:555) found that 59% of the professional orchestral musicians whom they had surveyed experienced MPA, which had a significant impact on their personal or professional lives.

Salmon (1990:3) suggested the following MPA definition: “MPA is defined as the experience of persisting, distressing apprehension about and/or actual impairment of, performance skills in a public context, to a degree unwarranted given the individual’s musical aptitude, training, and level of preparation”. Kenny (2011:48) noted that Salmon’s definition referred to accomplished musicians only and pointed out that MPA is experienced by musicians of diverse abilities, ages, training, experience, and preparation. Kenny (2011:61) therefore proposed a more thorough definition of MPA:

> Music performance anxiety is the experience of marked and persistent anxious apprehension related to musical performance that has arisen through underlying biological and/or psychological vulnerabilities and/or specific anxiety-conditioning experiences. …It affects musicians across the lifespan and is at least partially independent of years of training, practice, and level of musical accomplishment. It may or may not impair the quality of the musical performance.

MPA affects all musicians irrespective of age, and the symptoms experienced by children, adolescents, university students and professionals are similar (Braden, Osborne & Wilson 2015:1; Brugués 2011a:102; Kenny & Ackermann 2009:394). Classical music students report higher levels of performance anxiety than jazz majors (Kenny & Ackermann 2009:394), and music students have reported higher incidence of MPA than professional musicians (Osborne, Greene & Immel 2014:2).

Cognitive, physiological and behavioural aspects are involved in a stress response such as MPA. Ostwald et al. (1994:51) name cognitive symptoms, such as extreme apprehension, fear of memory lapses, losing control and being humiliated, as well as physical symptoms, such as muscle tension, shaking, dry mouth, palpitations and shortness of breath. Self-handicapping and perfectionism are traits that are linked to MPA (Lehman, Sloboda & Woody 2007:153).

MPA often starts in early childhood. Despite parents and teachers offering support and encouragement, their emphasis on achievement creates pressure on children (Lehman, Sloboda and Woody 2007:145). According to Kenny (2011), children do experience MPA and there is complex and variable causality. A review by Brugués (2011a:105) documented that the highest measurements of MPA were found in adolescent musicians between the ages of 14 and 19. The transition from childhood to adolescence, which is characterised by increased cognitive ability; self-evaluative capacity; family, environmental and interpersonal influences; technical accomplishment; and the types of performance experiences was therefore a critical period. Female musicians were more susceptible. Fehm and Schmidt (2006:98) found that roughly one third of adolescent musicians experienced a debilitating effect of MPA on performance. Nussek, Zander and Spahn (2015:36) investigated MPA in children and adolescents playing classical and popular music and found differences in MPA

between the different genres. Larsen (2005:45) found that over 50% of the students in her study had MPA in the moderate to high category when starting their tertiary studies. Girls were more susceptible than boys according to Nussek et al. (2015:36) and Brugués (2011a:105).

The most common reasons for MPA are the pressure of high self-expectation and concerns about the potentially debilitating effects of extreme physical arousal. The causes of MPA in college students include lack of preparation, self-pressure, lack of self-confidence in general, repertoire level difficulty, and extreme physiological arousal (Osborne, Greene & Immel 2014:2). According to Kenny and Ackermann (2009:395), factors interacting with MPA and its effect on performance include the performer's level of skill, the mastery of the material, the matching of the levels of difficulty and ability, and circumstances, such as type of audience and situation, as well as the severity and manifestation of MPA. Researchers have found that the interaction between the individual performer's trait anxiety, the level of task mastery, and the degree of perceived situational stress are the three aspects that determine performance quality (Kenny & Ackermann 2009:395).

Kirchner (2003) determined that the perception of a threat triggered mental, physiological and emotional responses. The intensity of MPA was increased by a dominance of negative affect, decreasing the performer's self-confidence. The objective reality and the performer's perception were blurred. They felt a fear of negative disapproving evaluation, which led to a lack of discrimination between their playing and their self-worth. This extrinsic focus caused further negative emotions, increasing the symptoms of sympathetic nervous symptom arousal, resulting in increased negative thoughts and feelings. The acknowledgment of the facilitative aspects of elevated arousal and its positive utilisation is therefore essential, confirming that education on MPA should be included in musical training.

Sasso (2010:328) points out that it is necessary to distinguish between the facilitative and debilitating aspects of MPA. Heart rate and muscular tension have been shown to increase in musicians from a rehearsal to a performance, and these kinds of

physiological symptoms may be interpreted as facilitative or debilitative. Osborne, Greene and Immel (2014:1) are of the opinion that “negative, catastrophic interpretations feed debilitating performance anxiety”. One should therefore not deal with all performance anxiety as though it were “mental illness” (Sasso 2010:328). The experience of some anxiety is an expected part of performance, and moderate arousal facilitates the focus required for optimal performance (Sasso 2010:328; Kenny & Ackermann 2009:395). Nussek, Zander and Spahn (2015:30) describe the various levels of MPA as either performance-enhancing or performance-disturbing.

Spahn, Echternach, Zander, Voltmer and Richter (2010:182) found significantly elevated heart rate and blood pressure measurements in opera singers with MPA. The psychological and physiological variables of MPA measured did not link in a coherent trend, and cognitive responses to performing were also diverse. The perception of physiological arousal varied as it was energising and facilitative in some cases, but negative and debilitating in others. Similarly, Yoshie, Kudo and Ohtsuki (2008:131) concluded that “what distinguishes individuals with high trait anxiety from those with low trait anxiety seems to be the perceptual sensitivity to the physiological and behavioural changes associated with psychological stress”. The complex physiological and psychological variables of MPA, together with the diverse individual perceptions, responses and behaviours, require multidimensional treatment approaches.

2.8.3 Music Performance Anxiety Treatment

Spahn (2015:129) and Spahn et al. (2010:175) emphasise the need for prevention, the inclusion of positive strategies, and collaboration with music educators in MPA treatment. Various skills for developing performance confidence include mental imagery, muscle relaxation training, improvisation training, mental practice, sufficient rest, systematic rehearsal, increased exposure to performance situations, positive self-talk, meditation, utilisation of heightened arousal for positive performance effects, self-trust and focusing on the music (Lee 2002:37).

Multifaceted approaches to treatment are recommended, attending to both the psychological and physiological symptoms, including psychoanalytic and cognitive behavioural therapies, somatic approaches and mental techniques (Spahn 2015:129; Spahn et al. 2010:175). Kenny (2011) gives a comprehensive outline of beneficial interventions for MPA, including cognitive behavioural and psychodynamic therapies, as well as performance-based approaches. Aspects such as the different functions of anxiety in performance, and skills, such as goal setting, practice skills, pre-performance routines, imagery and mental practice are highlighted. Prescription and other medications and their appropriate use, as well as self-administered substances are discussed.

A combination of cognitive and behavioural techniques has been shown to reduce MPA levels, such as cognitive behavioural therapy (CBT), systematic desensitisation, hypnosis, psychotherapy, and mind-body techniques, such as biofeedback, the AT, breath awareness, progressive muscle relaxation and meditation (Khalsa et al. 2013). Positive psychology techniques used with athletes are now also used with musicians, such as mental skills, positive visualisation, goal setting, utilisation of strengths, cultivating flow, relaxation training and analysis of optimal performance states (Braden, Osborne & Wilson 2015). Nagel (2010) explains that CBT effectively modifies conscious negative and destructive thoughts, attitudes and behaviours contributing to MPA, whereas in the psychodynamic approach, MPA is understood as being caused by multiple factors stored deep in the unconscious mind and often related to early childhood.

Kirchner, Bloom and Skutnick-Henley (2008:59) state that flow and the skill of performing without destructive self-critique is significantly negatively correlated with MPA, suggesting that cultivating a flow state in performance may mitigate the severity of MPA. Farnsworth-Grodd (2013:317) found that mindfulness training enabled self-regulation of MPA. Behavioural changes that reduced the severity of MPA were increased adaptive coping choices, confidence, anticipating success, goal-focused determination and diminished avoidant coping strategies. During performance, the

ability to focus on positive aspects, self-compassion and self-acceptance enabled adaptive ability.

Chang, Midlarsky and Lin (2003:126) found that an eight-week meditation training programme lowered MPA levels in tertiary music students. By the same token, yoga, which includes both the cognitive aspect in the practice of meditation and the somatic aspect in the practice of physical postures and breathing exercises, was shown to be an effective method for the treatment of MPA (Khalsa, Butzer, Shorter, Reinhardt & Cope 2013:34; Stern, Khalsa & Hofmann 2012). De Figueiredo Rocha, Marocolo, Corrêa, Morato & Da Mota (2014:111) documented an association between physical activity and MPA, and found that physically-active college music students had lower MPA levels than their physically-inactive peers.

Broomhead and Skidmore (2014:33) discuss the incorporation of specific 'expressive performance mindset' skills training in music instruction. Nagel (2010:147-148) advocates preventative education for MPA, proposing that "the psychology of performance and career counselling be incorporated formally in [sic] interdisciplinary programs in music education". Osborne, Greene and Immel (2014:12) evaluated a performance psychology programme with university music students. Levels of MPA were significantly reduced and psychological performance skills, such as self-belief, self-confidence, acceptance, reduced distractibility and resilience were substantially improved.

Hoffman and Hanrahan (2012:10) assessed the effects of short-term mental skills small group workshops to target MPA in amateur, student and professional musicians. Cognitive restructuring skills and imagery techniques, which were drawn from sports psychology, were taught and tailored to suit musicians' needs. There was a significant reduction in self-reported anxiety levels and a significant increase in performance quality compared to the control group. Braden, Osborne and Wilson (2015:7) found that a CBT group intervention for MPA treatment in high school music students led to significant reductions in self-reported MPA. Longer-term benefits existed in that the MPA reduction was sustained after two months.

Roughly 30% of musicians self-medicate, using beta-blockers to reduce somatic symptoms (Osborne, Greene & Immel 2014:2; Fishbein et al. 1988:4). Although mostly used occasionally, most of them also do so without prescription, which is not advisable. Beta blockers or any other prescription medication for MPA must only be used under medical supervision together with psychotherapy or counselling due to the possibility of side effects (Brugués 2011b:169; Nagel 2010:142).

The following section focuses on the relevant SA literature on the psychological aspects of musicians' occupational health.

2.8.4 South African Research on Psychological Aspects and Music Performance Anxiety

Seven South African studies that investigated the psychological aspects of musicians' health and performance were identified. Panebianco-Warrens, Fletcher and Kreutz (2015) found that music students in South Africa had low scores in terms of health responsibility, stress management and physical exercise. Healthy behaviour and positive affect were strongly associated, as were spiritual growth, self-efficacy and interpersonal relations. Students seldom consult a doctor to report their symptoms, and tend not to seek guidance and counselling, suggesting a lack of awareness of performance-related issues. Despite several aspects of health behaviour having low scores, the student musicians generally "report positive psychosocial behaviour in higher scores for spiritual growth, interpersonal relations, self-efficacy, and self-regulation" (Panebianco-Warrens et al. 2015:789).

Siebrits (2005) explored the emotional and occupational impact of injury on musicians, and discovered that a large amount of emotional trauma could have been avoided if music teachers had been able to give earlier and more appropriate advice, and if medical specialists had diagnosed and treated correctly. A range of participants' emotions were identified, particularly concerning the loss of their chosen occupation.

While studying the relationship between MPA and emotional intelligence (EI), Van Rensburg (2005) examined the role of EI as a cognitive-positive approach to managing emotions, and explored its benefits for musicians' in terms of controlling MPA. Participants' state- and trait-anxiety were measured, resulting in a strong positive relationship. The study found a significant inverse relationship between MPA and EI and, specifically, between the intrapersonal and stress management aspects of EI and state- and trait-anxiety.

Foxcroft and Panebianco-Warrens (2012) explored pianists' perceived emotional engagement with the music during performance. Musical emotions were related to the mood and character of the music, whereas non-musical or everyday emotions were related to the circumstances of the performance. Both kinds of emotions could enhance performance and expression, but uncontrolled emotions could impair performance. Emotional compartmentalisation was necessary to retain listening and concentration, and to enable an emotionally-expressive performance. During preparation, the pianist-performer experienced a dialogue with the composer, which, in performance, became the cognitive-emotive duality of their stage persona (Foxcroft 2014:131). Foxcroft and Panebianco-Warrens (2012:330) found that "the ideal mental state was characterised by highly focussed concentration, and resembles a state of Flow".

Swart (2014) examined the influence of psychological trauma on musicians, and how various famous performing artists' trauma and severe adversity led to Post-Traumatic Growth. She describes how interference, trauma and anxiety have a negative impact on performance, and asserts that it is necessary to ascertain the 'positive' level of physiological arousal which facilitates the 'flow' state, highlighting the need to be able to trust the normal process of physiological arousal (Swart 2014:386). Swart (2009:ii) found that "anxiety and tension-related problems had pronounced effects on music performance and high levels of 'stage fright' were reported by previously traumatized participants". Swart (2013:13) recommends the inclusion of educational psychology modules in music teachers' training, as well as transdisciplinary collaboration between researchers, musicians and psychologists.

Marshall (2008:ii) explored the literature on musical influences on MPA, specifically the use of music to alleviate it, and investigated a variety of perspectives on and theories about MPA. Kirsch (2006:ii) examined the psychological aspects of the student-teacher relationship in one-on-one tertiary instrumental music teaching, concluding that with a more student-centred focus, the teacher has a facilitative role, where students feel more valued and accepted, are more proactive, take responsibility, think critically, solve problems and feel able to express themselves.

Together, these few studies provide insight into the research on musicians' psychological well-being in SA. The limited number clearly shows the urgent need for further SA research in the field. The replication study by Panebianco-Warrens et al. (2015) extended previous research findings from a study abroad, and confirmed that music students' health-related behaviours are similar despite varying socio-cultural contexts.

Before concluding this overview of the literature on musicians' psychological health, the final section will discuss the research on the psychological consequences of injury.

2.8.5 Psychological Impact of Injury

Rickert, Barrett and Ackermann (2014b) found that the experience of being an injured orchestral musician caused emotional trauma. Injured musicians felt socially ostracised, found the lack of understanding from colleagues and management very challenging and, due to the loss of their performer identities, experienced diminished self-worth and depression. Medical professionals often did not understand the musicians' performance requirements, and recovery time was usually underestimated, compounded by the fact that "standard models of healthcare and injury insurance were inadequate at addressing the elite and highly specific rehabilitation requirements of the professional orchestral musician" (Rickert et al. 2014b:131).

Almost all the research on the psychological impact of injury describes the traumatic loss of identity, as well as that of self or self-concept or musical identity (Oakland,

Macdonald & Flowers 2014; Schoeb & Zosso 2012:135; Grant 2009:134; McCready & Reid 2007:144; Buller 2002). Similarly, Oakland et al. (2014) and Buller (2002) refer to the resulting disembodied self and disembodied musical self.

Several studies explore specific psychological consequences of injury. Grant (2009:134) describes the profound impact of PRMD on her "physical, emotional, social and psychological self". She discusses the loss, shame, serious depression, loneliness, constant pain, disability, guilt, and repercussions associated with revealing the existence of an injury. Nolet (2013:437) depicts the immense stress and potential mental breakdown. Buller (2002) explains the waiting and rehabilitation; growing through injury and pain; the grief, suffering, destruction, devastation, deep emotional pain, and hope. Oakland, Macdonald and Flowers (2014) illustrate the emotional distress, trauma and career disillusionment. In the study by Schoeb and Zosso (2012:135), the multifaceted link between health and performance was investigated. Musicians as artists, their connection with their instruments, and their sensitivity and passion were some of the factors that played a role, suggesting the need for a more comprehensive approach to musicians' health issues.

Among high school and university musicians, McCready and Reid (2007:144) found that the disruption caused by PRMD had a significant impact. The students felt a strong sense of belonging to their musical peer group. Their drive for musical progress created emotional conflict with having to respect their body's limits. Playing through pain occurred because of both the passion for music and the need for constant achievement. Health professionals and music educators may benefit from understanding what playing an instrument means to a student and the many psychosocial factors attached to it. Similarly, Park, Guptill and Sumsion (2007:95) found that although tertiary level musicians acknowledged the risk that a PRHP posed to their careers, they still wanted to pursue music as it held immense occupational value. They enjoyed and loved music, particularly motivated by the social aspects, and hoped for lifelong playing. Interestingly, several students stated that injury prevention courses were available, but that they were very poorly attended.

This leads to the issue of prevention. Concluding a systematic review of the prevalence of pain among various musician groups, Silva, Lã and Afreixo (2015:8) state that “health and educational policy makers should become aware of the high prevalence of pain affecting performance practices, so that pain-associated mechanisms are investigated, and preventive strategies are tested and implemented”. It is therefore necessary to investigate the literature on the prevention of musicians’ occupational disorders.

2.9 THE PREVENTION OF MUSICIANS’ OCCUPATION-RELATED DISORDERS

Musicians’ occupational health research has documented consistent PRMD prevalence rates despite the increased knowledge, and research on pre-emptive and effective prevention interventions is only a recent development (Ackermann 2016:246). It is imperative that new approaches be put into action and “future efforts should be given to developing and implementing prevention strategies” (Rickert, Barrett & Ackermann 2015:2). The postural aspects and physical conditioning factors relevant to injury prevention in musicians will now be addressed.

2.9.1 Postural and Physical Conditioning Aspects of Prevention

The essential components of PRMD prevention include the awareness of postural aspects, biomechanics and techniques of mastering the instrument, and maintenance of overall good physical condition through appropriate exercise and training (Kenny & Ackermann 2009:392). The maintenance of physical conditioning includes strength, flexibility, endurance and cardiovascular fitness (Rietveld, Macfarlane & de Haas 2013:450; Lee, Carey, Dubey & Matz 2012:85; Lederman 2010:70; Shafer-Crane 2006:830; Brandfonbrener 2001:23).

As elaborated on earlier, poor posture is a major risk factor for PRMD as the prolonged sustaining of playing positions requires static loading of neuromusculoskeletal

structures (Ackermann 2010:249). Several papers include information on musicians' postural requirements (Shoebridge, Shields & Webster 2017; Baadjou, Verbunt, Van Eijsden-Besseling, Samama-Polak, De Bie & Smeets 2014; Lee, Carey, Dubey & Matz 2012:86; Guptill & Zaza 2010:30; Steinmetz et al. 2010). According to Shoebridge et al. (2017:822) appropriate posture for musicians can be described biomechanically as "maintaining mobile limbs with stable, responsive body alignment, a balanced base of support to minimize stress and maximize efficiency, and being able to re-align after necessary postural deviations", emphasising, however, that biomechanical factors and musical performance requirements must both be taken into account. Posture was also seen as "a cognitive, emotional, physical, situation-specific response" in which the whole person was involved, reflecting a biopsychosocial approach to health (Shoebridge et al. 2017:825). The authors describe essential qualities, such as continual rebalancing and adjusting of the body with the instrument, the musical requirements, and the environment, and the importance of maintaining ease and challenging unwanted habits. Their participants all described optimal posture as "efficient coordination enabling the best possible performance with the greatest efficiency" (Shoebridge et al. 2017:834).

Baadjou et al. (2014) describe important postural considerations, including body and breathing awareness, postural balance, controlled movements and awareness of tension release. Lee et al. (2012:86) highlight spinal alignment, stabilisation of the head, neck and trunk, together with cognisance of "body-mind behaviour", breathing awareness and "kinaesthetic re-education". The importance of the lumbopelvic and scapular postural stabilisation systems in the prevention of PRMD was shown in the study by Steinmetz et al. (2010:610). Among various postural factors, Guptill and Zaza (2010:30) describe a balanced posture without over-extension or slouching, give advice on the height of the music stand, neutral joint positions and ergonomic principles, and emphasise the avoidance of static positions. Deficient posture can be

improved by means of somatic methods which develop body awareness and balance, thus developing proximal stability and improved postural muscle sequencing.[15]

Despite different individual needs, instrumental requirements and pedagogical approaches, postural guidelines and optimal biomechanics must be defined (Ackermann & Adams 2004b:673). Correct posture reduces stress on each joint and even with asymmetrical instruments improved trunk muscle support and balance will avoid injury and allow for the necessary fine motor control (Kenny & Ackermann 2009:392). Guptill and Zaza (2010:31) highlight the significance of reduced force and tension. Similarly, Ackermann (2010:250) describes gentle shifts in balance and whole-body mobility to support playing movements, whether standing or sitting.

Postural variations impair or assist breathing capacity and ease, and efficient movement with better biomechanics improves tone production in addition to being essential to injury prevention. Addressing whole-body use is therefore very important, with proprioceptive and sensorimotor training, and linking auditory input with movement (Ackermann 2010:251), as tone production and control require optimum use of the specific muscles or parts of the body involved (Meinke 1998:60). Ackermann (2010:267) concludes that “the ultimate goal of the musician is to create a high-quality sound”. The integration of musical expression, posture, technique and efficient whole-body use is critical (Ackermann 2010:252).

Whole-body use is explained by Ackermann, Adams and Marshall (2002a:33) who state that “the distal upper-limb musculature tends to be overworked, with proximal upper-limb and trunk muscle groups being neglected”. Similarly, Steinmetz and colleagues (2010) found that postural stabilisation systems (PSS) were impaired in almost all musicians with PRMD. The authors recommend the inclusion of postural assessment and training in prevention interventions, adding that stabilising a musical

[15] Shoebridge et al. (2017:821); Baadjou et al. (2014:232); Rietveld, Macfarlane and de Haas (2013:449), Lee, Carey, Dubey and Matz (2012:85); Foxman and Burgel (2006:315); Shafer-Crane (2006:830).

instrument may be asymmetrical and that it requires accurate knowledge of biomechanics to minimise energy expenditure and maximise efficiency.

Carrying heavy instruments should be done in the most efficient and ergonomic way, and musicians should have the right music stand height and lighting, stage set-up, and chairs to facilitate good postural awareness (Ackermann 2010:262). There are many manufacturers of ergonomically-designed chairs used in orchestras that are fully adjustable in terms of seat and leg height, seat tilt, back rest height and tilt and forward or backward position (Horvath 2001:103). Instrument maintenance is essential, and in general, proper instrument care reduces playing effort and aids postural efficiency. Changes can be made to facilitate playing such as the bridge height on a violin, cello or viola which affects the distance at which the strings are depressed by the fingers (Storm 2006:897).

Posture may benefit from ergonomic adaptive design modifications, such as customised chin and shoulder rests for the upper strings, and various designs of support straps and devices for woodwinds and guitars (Dommerholt 2010a:69; Foxman & Burgel 2006:314; Lederman 2002:168). Orthotic devices and key modifications can improve hand positions. The size of instrument, for example in viola, has been shown to make a difference, and chair modifications can assist with postural issues (Hansen & Reed 2006:793; Storm 2006:900; Bejjani et al. 1996:410). A polymer type of drumstick with reduced vibration, a modified hand splint for a trombonist with reach difficulties, or an angle-headed flute are other examples (Kenny & Ackermann 2009:393). Ergonomic instrument adaptations can be used successfully along with correct set-up and awareness of posture but will not be effective if used to perpetuate poor playing and postural habits (Ackermann 2010:262). For example, it is not known whether the use of a clarinet neck strap may have long-term effects from transmitting the load through the neck (Kenny & Ackermann 2009:391).

Physical activity has been shown to be both physically and psychologically beneficial, and specific exercise programmes for musicians have had positive results on aspects, such as muscle strength for instrument support and posture, improved ease of

movement and lowering rates of perceived exertion and PRMD frequency and intensity (Chan, Driscoll & Ackermann 2014:185; Ackermann 2010:257; Kava et al. 2010:1; Kenny & Ackermann 2009:393). Studies on the effectiveness of specific musicians' exercise programmes have found that conditioning exercises, postural programmes, kinaesthetic training, and trunk and shoulder stabilisation exercises were beneficial in the prevention and treatment of PRMD (Kava et al. 2010:1). Their participants reported a significant decrease in pain, fatigue and perceived exertion during instrumental performance, as well as improvements in posture, breath control, muscle tension and endurance, thus enabling them to achieve higher levels of musicality. Similarly, Ackermann and colleagues (2002a:40) found that endurance training was beneficial to undergraduate music majors in that perceived exertion whilst playing was substantially reduced. An endurance-focused exercise programme, together with functional task-related strengthening exercises, is therefore recommended. Wilke, Priebus, Biallas and Froböse (2011:28) also reported that musicians with better physical fitness found the physical demands of playing easier as regular training lowered the perceived exertion. The authors suggest a balanced physical training approach combining strength, endurance and flexibility to be adapted to the specific instrument requirements.

Warm-up strategies may help prevent PRMD, and flexibility is improved with regular stretching (Lee, Carey, Dubey & Matz 2012:86; Guptill & Zaza 2010:29; Lederman 2010:70; Kenny & Ackermann 2009:393). Stretching is controversial and is potentially harmful when done aggressively or inappropriately. Mobilisation, with correct stretches, however, enhances circulation and minimises muscle fatigue (Shafer-Crane 2006:831). Warm-up exercises are beneficial in that they improve blood flow and facilitate nerve gliding and mobility (Foxman & Burgel 2006:311). Cooper, Hamann and Frost (2012:71) found that stretching exercises during rehearsals decreased physical discomfort levels among string students.

The postural and movement aspects of performance are undoubtedly imperative preventative considerations. Dommerholt (2009) notes an important fact that is often overlooked, namely that musicians spend more time practising and rehearsing than

playing in performances. It is therefore essential to examine practice habits as part of preventative interventions.

2.9.2 Practice Strategies and Prevention

Collectively, researchers agree on the importance of efficient practice habits with breaks, pacing and consistency to prevent injury and attain optimal results.[16] Brandfonbrener (2001:23) asserts that:

> There must be an appreciation of the importance of what transpires in the practice room that may be damaging, for example, bad habits that go uncorrected for long periods of time until they are difficult to unlearn.

Williamon and Valentine (2000:353) maintain that the aspect of practice quantity tends to be overemphasised and state that the content and quality of a musician's practice must be assessed. The quality of practice depends on a number of variables, including factors related to personality, motivation, maturity and emotions, and factors related to the physical practice activity itself, such as practice duration, consistency and incorporating varied strategies, for example mental rehearsal. In referring to self-regulation as an essential element of successful practice, Lehman, Sloboda and Woody (2007:78) state that "this means that a person can select appropriate strategies, plan, monitor the outcome, and revise according to the difficulties encountered". In their well-known study on expert performers, Ericsson, Krampe and Tesch-Römer (1993) proposed the concept of 'deliberate practice', which is a structured, goal-oriented and 'effortful' activity necessary for developing expert instrumental skills. Crucial factors involved are sustained motivation, focused attention, parental and environmental support, and the skill of constantly evaluating and improving playing during practice.

[16] Ackermann et al. (2015:19); Dick et al. (2013:400); Dawson (2012:111); Rosenbaum et al. (2012:1270); Guptill and Zaza (2010:31); Hoppmann (2010:210); Lederman (2010:70).

Mental practice, which includes visualisation, the use of imagery and reviewing the score is an important part of prevention (Guptill & Zaza 2010:31; Dommerholt 2009:314). During rehabilitation, for example, finger movements practised in the mind whilst a hand is immobilised have improved functional recovery (Rietveld et al. 2013:431). Bernardi, De Buglio, Trimarchi, Chielli and Bricolo (2013:12) found that mental practice is effective for musicians practising complex motor sequences as it "can improve fine motor control in terms of movement velocity, movement timing, and coordination". Physical practice, supplemented with mental strategies, accelerates learning because utilising the aural and kinaesthetic imagination before physically playing clarifies musical goals and improves efficient body use, whereas mental review after playing consolidates skill acquisition (Freymuth 1999:24). Freymuth (1993) discusses several approaches to mental rehearsal, such as the use of imagery with both internal and external perspectives, and ongoing alternation between mental and physical repetitions.

Altenmüller (2016:51) points out important facets of constructive practice, such as taking breaks to allow for motor learning to consolidate (including sleep); mental practice; varying the focus of practice to prevent physical and mental fatigue and overuse; developing individualised constructive practice strategies; avoiding going beyond physical and mental limits; and understanding the impacts of over-practising, destructive self-critique and perfectionism.

Many of these practice elements are associated with the type of teaching and learning environment to which the music student is exposed and the attitudes that are promoted. This raises questions about preventative strategies in music education, which will be examined in the next section.

2.9.3 Prevention Strategies in Music Education

The multiple beneficial effects of making music are well documented, yet as Altenmüller (2016:51) emphasises, these depend on the integral role of the music teacher in fostering positive learning experiences and incorporating both physical and

psychological preventative strategies. Well-being can then become an intrinsic part of the experiential learning process, comprising physical awareness, proprioception, mindfulness, movement ease and efficiency, all continually supported and connected by the auditory perception and imaginative aspects of music. Musical expression and creativity are part of the teacher-pupil relationship: “Here, a rich artistic environment, empathy and emotional depth will contribute to a successful musical education and interaction” (Altenmüller 2016: 51).

Therefore, the relationship with the teacher has a significant influence on a musician and contributes to the risk of playing-related injury (Guptill 2011c; Nagel 2009:17). Price and Watson (2011:323) highlight the role of the teacher in balancing the physical, mental and emotional challenges, and handling the transition from student life to becoming a professional. Nagel (2009:17) suggests “training healthy people who are musicians”.

Research shows that studio teachers are usually the primary source of support and information on health-related matters but may not have adequate training and knowledge (Clark & Lisboa 2013:162; Pierce 2012:163; Williamon & Thompson 2006:424). Similarly, Norton (2013:72) found that college-going musicians experiencing a performance-related problem usually seek advice from their teacher, a friend or family member. Yet most music teachers are ill-equipped as they are often informed only by their own experience and opinions (Pierce 2012; Palac & Grimshaw 2006:878). Ioannou and Altenmüller (2015:141) found that music conservatory teachers did sometimes talk to their students about health promotion although the frequency was low.

Quarrier (1995:110) reported that a survey of music teachers’ attitudes to injuries revealed inconsistencies in that most teachers reported that only 10% of their students had been injured, a figure incompatible with all other PRMD prevalence data. Either teachers were not open to admitting that their students were injured or students were not open with their teachers when it came to disclosing injury. Brandfonbrener (2001:25) maintained that most pupils do not share their symptoms with their teacher,

stating that “the peculiarities of the teacher/student relationship in music is fascinating and lends itself to much which can be positive and singularly important, just as it can be potentially hazardous when abused”. Research shows that music teachers who have learnt about prevention of injury teach it to their students (Guptill & Zaza 2010:28).

Fostering the enjoyment of music-making alongside appropriate challenges is essential (Mennen, Sakai, Ceruso & Winspur 2012:2). The prevention of issues such as MPA therefore begins with integrating constructive approaches to performance psychology within music education, such as empowering students to understand the positive aspects of elevated arousal, learn objective self-assessment, develop proactive learning styles, and cultivate and practise a positive performance state (Sternbach 2008). Similarly, Kenny and Ackermann (2009:397) emphasise the importance of the prevention of MPA through “sound pedagogy, appropriate parental support and expectations, and the learning of self-management strategies early on in one’s musical education”. Choice of repertoire is important in that it should be well within the student’s range of technical and interpretative skill. Non-judgmental positive performance opportunities, where music is purely recreational and not competitive or evaluative, are essential and comprehensive musical and psychological preparation is necessary for auditions, exams and competitions. The teaching ethos should nurture emotional well-being and enable the student to handle criticism through “realistic self-appraisal capacity” (Kenny & Ackermann 2009:397).

Sternbach (2008) mentions how perfectionism and harsh self-critique may contribute to MPA. Pruett (2010:351) states candidly that “it helps to know, earlier rather than later, that the pursuit of perfection is best left to the gods”. According to Levine and Levine (1996:16), the silent danger of perfectionism, which is endemic in music education, contributes to musicians’ chronic emotional distress:

> Instrumentalists generally view whatever they produce on their instruments as flawed in comparison with the ideal they have set for themselves… In few other professions are the practitioners forced to confront their own professional failings so regularly, and this constant awareness of their personal limitations can lead to chronic internal conflict between diminished self-esteem and musicians’ natural desires to think well of

> themselves. The resulting emotional dissonance is bound to be stressful, perhaps even more so because it goes unacknowledged and unrecognized.

Roesler (2014:39) stresses the importance of developing positive musical practices through developing “authentic, interpersonal goals” focused on the development of technique to serve expression, and communicating and connecting with audiences rather than emphasising judgement which fosters anxiety. Robson (2004) investigated the pros and cons of competition in music education, as well as its effects on the development of MPA. Opinions vary, with some arguing that competition is an incentive for top achievement, whilst others maintain that elevated anxiety may lead “to a decrease in self-esteem, especially for individuals with an ego orientation (a focus on comparison with others) as opposed to a mastery orientation (focus on improvement of one’s own skills)” (Robson 2004:160). In a similar vein, Pierce (2012:157) refers to literature describing the ‘maestro syndrome’ where the competitive music training culture supports harmful egotistical behaviour from teachers. Pierce (2012:158) unequivocally states that a fundamental change is needed to establish “a balance of competition and nurturing in the education of musicians; one that embraces person-centred learning and includes elements of the various value systems, including personal and collective wellness”. Attitudes reinforcing the competitive performing arts culture contribute to high injury rates and poor health behaviours. According to Rickert, Barrett and Ackermann (2015:12), “achieving long-term and lasting change may require a paradigm shift in the way that we set goals and appraise success within music education”.

Horvath (2008:32-33) therefore highlights the music teacher’s role in assisting students to develop a healthier attitude to playing. This enables skills, such as graded increases in practise time; recognising fatigue; using effective practice strategies; developing good technique with attention to posture, body awareness and musculoskeletal biomechanics; understanding rest and recognising why playing in pain is unacceptable. Sensible lifestyle habits comprising regular exercise, healthy nutrition and hydration, and sufficient sleep should be promoted. At festivals, young musicians often are faced with lengthy and intense rehearsal schedules. Teachers and conductors must therefore be educated to change these practices, be effective

role models and reduce students' risk of injury (Horvath 2008). This view is supported by Rickert et al. (2015:2), who state that "the music education sector is well placed to be at the forefront of such injury prevention efforts because it is in music schools that students adopt the attitudes, values and behaviours that will define their professional careers".

Music educators should be "the first and last line of defence" (Buchanan & Hays 2014:22) because although there has been considerable growth in awareness, acceptance and knowledge of risk factors for musicians' PRHP, the prevalence is still high, which indicates that preventative education is paramount. Buchanan and Hays (2014:2) encapsulate the reason for health education for music teachers:

> Investigating the issue of how best to train musicians to ensure optimal performing skills should be inclusive of sound pedagogical practices and a focus of ongoing research. Empowering musicians with the knowledge and skills for mindful music-making free from biomechanical deficits is both the goal and the solution.

Considering their critical role, teachers should be educated about musicians' health and equipped with knowledge on anatomy and physiology (Britsch 2005:43; Heming 2004:66; Brandfonbrener 2001:24). Health promotion education should be made a part of music teacher training so that younger populations can be reached.[17]

2.10 CONCLUSION

An overview of the research on musicians' occupational health has been presented in this chapter. Relevance was initially established with an outline of the field's background and a discussion of the physiology and psychology of musical performance. The research on the prevalence of occupation-related disorders in musicians was presented, with a synopsis of the studies on diverse musical

[17] Ioannou and Altenmüller (2015:141); Laursen and Chesky (2014:142); Pierce (2012:169); Palac (2008:21); Rardin (2007:16); Chesky et al. (2006:143); Dawson (2006:36).

populations. The subsequent examination of the research on risk factors provided a deeper understanding of the causes of PRHP and what is therefore needed for preventative interventions.

The literature on musicians' neuromusculoskeletal health, hearing conservation, and vocal and psychological health was reviewed separately as these four categories were the four major health promotion areas defined by the HPSM conference (Palac 2008:20). The section on the types of PRMD, along with PRMD literature organised according to specific instrument groups, including a sub-section on SA studies, concluded with research on PRMD rehabilitation. Rehabilitation aspects were reviewed as this also provides insight into preventative strategies and the benefits of interdisciplinary collaboration. The literature on hearing problems in musicians, in terms of prevalence, student musicians' risk, and hearing conservation recommendations was described, followed by a short review of the vocal health research, explaining vocal health maintenance and injury prevention. The psychological health aspects of musicians' occupational health, including psychosocial and work factors, music performance anxiety prevention and treatment, SA studies on aspects of musicians' psychological well-being, and the psychological impact of injury were explained by means of an analysis of the literature.

The minimal research in SA related to musicians' occupational health reveals similar prevalence statistics and health concerns as compared to those in the literature conducted internationally. It plainly demonstrates the urgent need for the development of the PAH field in SA, and the prevailing lack of awareness, research, knowledge, clinical practice, education and prevention.

Overall, the research undoubtedly indicates that globally, musicians are a population who are at high risk of occupational injuries and health issues, which are widespread in diverse genres and at all levels, including professional, amateur and part-time musicians. Lifetime prevalence rates show that roughly 75% of musicians are affected, with point prevalence statistics of about 50%. These figures also apply to tertiary and pre-tertiary student musicians. Most of the literature indicates that female musicians

are more susceptible, although FD affects more men than women. In general, PRMDs are more prevalent in string and keyboard musicians, and the neck, shoulder, arm and back are the most commonly-affected regions. Most PRHPs are preventable because the majority of causal factors are modifiable. Three key areas of the prevention of PRHP in musicians were outlined in this review: postural and physical conditioning, practice approaches that are preventative, and preventative strategies within music education.

Yet studies show that most musicians had never received information on musicians' health, injury prevention or appropriate treatment and that preventative approaches usually only occurred in response to an existing PRHP. Chronic disorders are a concern, with many of extended duration, and research documenting complete recovery in only about half of the cases. According to the literature, NIHL and associated hearing problems are common and hearing conservation knowledge and behaviours are frequently deficient. The vocal health of singers and music teachers is often negatively impacted by overuse, misuse and lack of preventative knowledge.

Roughly two-thirds of musicians experience MPA that has an adverse effect on their performance, and depression and anxiety are frequently documented. Psychosocial aspects play a crucial part, with musicians' study and work environment associated with multiple occupational stressors. Psychological and physiological factors were reciprocally connected, pointing to the need for an integrated biopsychosocial framework in the development of both rehabilitative and preventative interventions. Behaviours, attitudes and awareness in educational and professional environments need to change in order to embrace health promotion as an integral part of music as an occupation.

Lifestyle and health behaviours are often lacking, for example, higher than recommended levels of alcohol consumption, low exercise participation and the erratic and financially stressful aspects of freelance musical work. Among popular musicians, repeated exposure to alcohol and drugs, together with the occupational stresses, is a detrimental combination. Roughly half of the popular musicians surveyed abroad do

not have health insurance, resulting in limited access to health care. Although no research on this exists in SA as yet, it is particularly relevant in the oversubscribed and under-resourced SA public health context, and the costly private healthcare system which is unaffordable for many. Consideration for adequate health care, education and occupational health support for musicians in poor socio-economic situations is therefore vital.

It is extremely important for this study to take cognisance of the alarmingly high prevalence rates of both musculoskeletal and psychological PRHP among tertiary and pre-tertiary student musicians. It is noteworthy that students were frequently reluctant to reveal their PRHP and often did not seek help, which provides evidence of the still prevalent accepted culture of non-disclosure and playing through pain.

The crucial factor, therefore, is prevention. The logical flow is that there is a need to investigate how to involve higher education settings where the music teachers and performers of the future receive their training. There has been a growing realisation that despite the large volume of research on PRHP in musicians, there has clearly been a shortage of translational research where the theoretical knowledge is translated into practice in the form of effective prevention implementation with interdisciplinary collaboration. The need for the coordinated study of prevention in educational and professional environments is obvious. Prevention interventions are extremely necessary and recommended extensively.

This raises the issue of occupational health education during musicians' tertiary studies, which will be examined in depth in the next chapter. Chapter 3 will therefore focus on the literature related to health education for musicians at tertiary level incorporating somatic methods, particularly Body Mapping.

CHAPTER 3
HEALTH EDUCATION FOR MUSICIANS INCORPORATING BODY MAPPING AS THE SOMATIC COMPONENT

3.1 INTRODUCTION

The previous chapter delineated the context and importance of musicians' occupational health literacy. A key conclusion reached was that prevention in higher music education settings is imperative. Chapter 3 will review the research related to occupational health training for student musicians in higher education, with a focus on the incorporation of somatic methods in musicians' health coursework. The field of somatic education and practices will be introduced and explained with reference to the literature, particularly its applications for musicians. The BMg approach will be explored in depth, and will include a discussion on its background, essential principles, neurophysiology, research, the process of applying the method, and its use in tertiary music training.

3.2 MUSICIANS' OCCUPATIONAL HEALTH EDUCATION AT TERTIARY LEVEL

Research shows that the implementation of health promotion education in music schools and orchestras is beneficial for reducing PRMD.[18] Heale (2013:42) refers to the fact that occupational health is taken seriously in other industries but not in the creative arts sector:

> For young people engaging in any other vocational training, Health and Safety is covered on day one! The main concern for these young aspiring musicians must be that they play safely now so they can enjoy and work in music for life!

[18] Chan, Driscoll and Ackermann (2014:187); Laursen and Chesky (2014:142); López and Martínez (2013:100), Dommerholt (2010b:128); Ackermann et al. (2002a:40); Spahn, Hildebrandt and Seidenglanz (2001:29).

3.2.1 Advocacy for Tertiary Musicians' Health Education

The inclusion of occupational health education in the curricula of tertiary music institutions is recommended extensively.[19] Kenny and colleagues (2009b:30) emphasise the need for translational research; the knowledge on the physiology of music making must be translated "into implementable teaching methods and curricula for music teaching institutions" (Rickert et al. 2015:14).

Prevention education for student musicians is crucial since they can be taught about risk factors and early prevention (Rasker & Bird 2013:420; Hoppmann 2010:225; Hansen & Reed 2006:797; Britsch 2005:44). Kaplan (1994:193) expresses the importance of holistically-integrated music training: "Conservatories should be responsible for educating the whole person, and providing an approach that integrates physical, mental, emotional, and artistic elements". In addition, Voltmer and colleagues (2012:13) express the broader implications of health promotion and injury prevention coursework: "Besides the positive influence on health, this would also help to preserve the joy and quality of the musical work of (professional) musicians".

Thaele (2016:81) recommends education in the prevention, treatment and management of musicians' health problems in the first two years of undergraduate study, inclusion of movement awareness methods in the curriculum, and the need to create a more open and accepting environment for supporting students' health and well-being. Thaele (2016:80) asserts that "PRMDs impact on students' ability to participate in their university education at an optimum level and there is a need for

[19] Lonsdale and Boon (2016:158); Rickert et al. (2015:426); Kok, Nelissen and Huisstede (2015:168); Panebianco-Warrens et al. (2015:12); Heale (2013:42); Pierce (2012:161); Guptill (2011b); Rodríguez-Lozano et al. (2011:154); Ackermann (2010:249); Kava et al. (2010:20); Montello (2010:109); Ginsborg, Kreutz, Thomas and Williamon (2009:257); Krayer-Luke (2009:10); Nagel (2009:15); Williamon, Wasley, Burt-Perkins, Ginsborg and Hildebrandt (2009:89); Barton et al. (2008:77); Barton and Feinberg (2008:53); Kreutz, Ginsborg and Williamon (2008a:57); Akel and Düger (2007:152); Chesky et al. (2006); Dawson (2006:36); Heming (2004:55); Hildebrandt and Nubling (2004:62); Spahn, Richter and Zschocke (2002:22); Spahn, Hildebrandt and Seidenglanz (2001:29); Altenmüller (1999:95).

more effective management of these problems from the students, teachers and the institution".

Responsibility for informing their students about musicians' occupational health and well-being must be accepted by the institution (Charnock, Hicks & Hayhurst 2014:51; Williamon & Thompson 2006:427). This was echoed by Brandfonbrener (2004:1), who wrote:

> Music schools in the past regarded their role as making available the best possible training for their students, so that these students could become skilled, competitive, and successful in their musical careers. However, music schools have come to recognize that their institutions have injured students in large numbers, leading these schools to confront the necessity of redefining their roles to include a responsibility for students' health.

Researchers advocate that children should be receiving preventative strategies from the beginning of their music education while playing habits and attitudes are developing.[20] Training music educators in injury prevention, body biomechanics, and health promotion strategies is therefore integral to 'breaking the cycle' of musicians' injuries (Guptill 2011b:277). Yet it is not only trained music educators who teach; most musicians who study performance also teach. Kaplan (1994:193) therefore argues for the inclusion of health promotion in performance students' studies stating that "the training one may receive as a performer is not sufficient in preparation for teaching. Many performer-teachers evolved a completely natural technique and are unable to articulate what they do".

Music teachers may be unwilling (or unable) to change traditional approaches, and "do not question physically inefficient or potentially harmful aspects of the tradition" (Shoebridge et al. 2017:831). Training future music teachers in health promotion and injury prevention is therefore imperative to create a culture of wellness in music

[20] Rickert et al. (2015:13); Clark and Lisboa (2013:166); Ginsborg et al. (2009:257); Barton and Feinberg (2008:47); Rardin (2007:123); Jones (2001:24).

education where music educators can be role models for their students.[21] Spahn, Strukely and Lehmann (2004:32) recommend prevention programmes for music students in which "preventive health consciousness should become a part of the responsibility involved in becoming a good musician and a good teacher". Yet this kind of training, including basic anatomy and where to get appropriate medical advice, is still rare (Ackermann 2010:249).

A concern, however, is that attendance at preventative programmes for orchestral musicians or music students has been disappointing (Ingle 2013:59; Park et al. 2007:94, Brandfonbrener 1997a:13). The challenge frequently faced is that the population at risk tends to be disinterested (Altenmüller 2003b:131). Similarly, Brandfonbrener (2003:239) states that it is usually very difficult to motivate healthy musicians to prevent future problems since musicians "are experts at denial. …much of what they do and how they do it has been unchanged through history and there is a reluctance to make changes unless they can be convinced that such changes are in their best interests".

Proactive preventative action by students is still rare due to lack of awareness (Spahn et al. 2002:27). Spahn, Voltmer, Mornell and Nusseck (2017:227) found that although engagement in preventative activities increased among students during their later years of study, PRHP prevalence rates remained high and preventative knowledge was lacking, suggesting that students were not integrating preventative behaviour into playing and practice.

The Health Promotion in Schools of Music (HPSM) Project Conference, which recognised the importance of musicians' health advocacy in music education in the USA, took place at the UNT Centre for Music and Medicine in partnership with the Performing Arts Medicine Association (PAMA) in 2004 (Palac 2008:20). The aim of the HPSM conference was to create interdisciplinary connections between healthcare

[21] Ingle (2013:58); Pierce (2012:169); Kava et al. (2010:18); Palac (2008:20); Dawson (2006:41).

experts and music education experts (Chesky 2006:44). The HPSM drew attention to the research showing that:

> The underlying physiological and psychological mechanisms for performance injuries are multidimensional and involve both individual and music-related variables as well as a myriad of social, environmental, and cultural factors. Because of this complexity, HPSM recommends Prevention Education and Intervention as the primary approach for schools of music to address these problems (Chesky, Dawson & Manchester 2006:142).

The conference outcome declaration acknowledged the need to "prepare health-conscious music educators and produce injury-free musicians" (Chesky et al. 2006:143). Health was defined as "a complete state of physical, mental, and social well-being" (Ibid. 2006:143). Music school faculty should be engaged in injury prevention among music students and collaborate with appropriate professionals (Ibid. 2006:143). The HPSM recommendations for music schools were fourfold: To integrate an ethos of health promotion; to offer occupational health coursework; to train students in hearing conservation; and to cooperate with both student health resources and performing arts health services (Ibid. 2006:143).

In collaboration with PAMA, the National Association of Schools of Music (NASM) in the USA adopted what were essentially the HPSM recommendations, and important musicians' health education policy has subsequently been developed. The 2012-2013 NASM Handbook (NASM 2013:67) states that:

> Students, faculty and staff …must be provided information regarding the maintenance of hearing, vocal, and musculoskeletal health and injury prevention. …Music program policies, protocols, and operations must reflect attention to maintenance of health and injury prevention. …Specific methods of providing information and addressing injury prevention, technology, and facilities are the prerogative and responsibility of the institution.

The NASM health and safety standard is mandatory for accreditation, applies to practice, performance, teaching and listening, and requires general as well as area-specific content (NASM 2013:67). Although it is a music education regulatory body only for the USA, the NASM policy on health standards is a significant benchmark internationally and for SA. It is the largest higher music education affiliation body, with approximately six hundred accredited schools of music, and stipulated standards for

musicians' occupational health. The HPSM project and the NASM health standards were both turning points in establishing widespread awareness of musicians' occupational health in the higher music education sector. Future studies will, no doubt, be necessary to ascertain how and to what extent the health standards are being implemented.

The imperative requirement for musicians' health education in the curricula of tertiary music studies is undeniable. Therefore, it is necessary to examine the content that comprises health promotion coursework, which is the focus of the following section.

3.2.2 Content of Tertiary Musicians' Health Education

Four main categories of musicians' occupational health needs were outlined at the HPSM conference: neuromusculoskeletal health, vocal health, hearing conservation and psychological health (Palac & Grimshaw 2006:880). Palac (2008:20) explains that music teachers should be equipped with strategies for health promotion in those four areas. They are therefore important categories for identifying the core elements of a tertiary musicians' health course.

According to Foxman and Burgel (2006:313), preventative education for musicians should include content on the risk factors for PRMD, posture awareness, reducing tension, decreasing force, ergonomic and instrument adjustments, instrument condition, proper lighting, seating adjustments, music stand height, instrument position, lifestyle, and somatic education, such as the AT, BMg or FM. Including education on anatomy, physiology, ergonomics and effective body use is essential.[22] Somatic practices, such as the AT, FM, yoga, t'ai chi and Pilates, have been shown to be beneficial for tertiary music students (Williamon, Wasley, Burt-Perkins, Ginsborg & Hildebrandt 2009:89; Williamon & Thompson 2006:423). Exercise programmes, body

[22] Rickert et al. (2015:12); Rodríguez-Lozano et al. (2011:154); Krayer-Luke (2009:10); Akel and Düger (2007:152); Heming (2004:66); Hildebrandt and Nubling (2004:68); Zuskin et al. (2004:250).

awareness work, breathing and postural training are consistently recommended.[23] Kava and colleagues (2010:20) highlight the inclusion of "trunk endurance and neuromuscular control exercises" as particularly beneficial to a tertiary programme for instrumental musicians. Collectively, researchers also agree on the importance of teaching students about efficient practice habits with warm-ups, breaks, pacing, consistency and graded increases in practice time.[24]

Education in hearing conservation is supported by the research.[25] Collaboration between audiology and music departments is suggested, and content should include annual audiometric evaluations, safe listening guidelines and proper use of hearing protection. Students should receive a baseline hearing screening when they start their tertiary music studies, and periodically repeated audiometric testing as part of the NIHL educational intervention (Olson et al. 2016:35; Rubinstein et al. 2013:34; Santucci 2009:105; Phillips, Shoemaker, Mace, & Hodges 2008:27; Miller, Stewart & Lehman 2007:164).

Biopsychosocial approaches for musicians' health education are recommended. Baadjou and colleagues (2014:232) discuss the inclusion of physical, psychological and behavioural aspects in a prevention programme. This biopsychosocial approach to prevention includes awareness of body posture as an essential core aspect, with balanced posture, controlled movements, freer breathing, and awareness of tension and relaxation. The psychosocial and behavioural inclusion acknowledges the role of stress, coping ability, perfectionism and anxiety in the development of PRMD in musicians. Nagel (2009:15), Zuskin et al. (2004:250), and Wynn Parry (2003:320)

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[23] López and Martínez (2013:106); Rodríguez-Lozano et al. (2011:154); Kava et al. (2010:1); Williamon, Wasley, Burt-Perkins, Ginsborg and Hildebrandt (2009:89); Kreutz, Ginsborg and Williamon (2008b:11); Foxman and Burgel (2006:315); Zuskin et al. (2004:250); Wynn Parry (2003:319); Ackermann, Adams and Marshall (2002a:33); Frederickson (2002:44).

[24] López and Martínez (2013:106); Dawson (2012:111); Guptill and Zaza (2010:31); Lederman (2010:70); Foxman and Burgel (2006:313); Ackermann and Adams (2004b:675); Wynn Parry (2003:319); Brandfonbrener (2001:25); Zaza (1998a:53).

[25] Dick et al. (2013:398); Rubinstein et al. (2013:24); Heale (2013:42); Callahan, Lass, Foster, Poe, Steinberg and Duffe (2012:42); Santucci (2009:103); Zander et al. (2008:25); Miller et al. (2007:164); Laitinen (2005:29); Zeigler and Taylor (2001:143).

similarly recommend that health promotion courses should include integrated psychological and physiological health content.

Ascenso, Williamon and Perkins (2017:14) identified important psychosocial aspects for the support of student musicians with regard to the challenging transitional phase into professional life, suggesting that:

> A highly developed musical self-concept should be the core focus of the curricula in later years, as well as focusing on creating peer networks, varied performance opportunities and growing self-discipline and autonomy.

Also addressing the broader range of skills needed by musicians, including musical, performance-related, psychological, physical, interpersonal and professional skills, Clark and Lisboa (2013:159) explored the long-term athlete development (LTAD) model, which emphasises "the intellectual, emotional, and social development of the athlete" and "enables participants to improve their overall health and well-being and increase their life-long participation in physical activity". The biopsychosocial, multifaceted and interdisciplinary nature of health education for student musicians leads now to a section highlighting the value of collaboration, and documenting some examples of feasible collaborative models.

3.2.3 Collaboration in Tertiary Musicians' Health Education

Musicians' injuries are mostly preventable because behavioural, environmental and educational risk factors are manageable. However, due to the multifaceted origins of PRHP, the combination of medical and artistic expertise is vital to establishing prevention programmes. The collaboration of music educators and health professionals in musicians' occupational health education has been suggested in many research study recommendations.[26] Palac and Grimshaw (2006:879) identify

[26] Ajidahun, Mudzi, Myezwa and Wood (2017:7); Ackermann (2016:247); Rennie-Salonen and De Villiers (2016:144); Thaele (2016:81); Rickert, Barratt and Ackermann (2015:13); Palac (2015:28); Norton and Greasley (2014:45); Ingle (2013); Lee, Carey, Dubey and Matz (2012:86); McGrath (2012:98); Wijsman (2012:21); Guptill (2011b); Barton and Feinberg 2008:53; Palac (2008:20).

the need for increased cooperation between musicians' health researchers and music educators to bring about tangible change in music education practice and curricula, and to increase the output of music-health research by musicians themselves.

Interdisciplinary partnerships and several departmental collaborations, for example at the UNT Texas Center for Performing Arts Health, enable clinical services, extensive research, and specialised musicians' and performing arts health education (University of North Texas 2018). An illustration of national collaborations is the Musicians' Health National Curriculum Initiative (MHNCI), which is supported by the Australian Learning and Teaching Council, and led by the University of Western Australia, and the University of Sydney, in partnership with several other institutions and organisations throughout Australia. The aim is to develop adaptable tertiary musicians' occupational health educational programmes. The project created "Sound Performers", an online multimedia performance health curriculum for tertiary music students. The interdisciplinary collaborative project has attracted national and international interest and brought about "new disciplinary synergies" (Wijsman 2012:6).

Thaele (2016:81) highlights the need to establish interdisciplinary networks and collaboration between performing arts, sports science and medical faculties at universities. Ingle (2013:59) outlines the critical need at conservatories for collaboration between medical professionals, music teachers and faculty administrators. Ackermann (2016) expands on this to include researchers in that medical professionals and researchers need to cooperate with the performers and their institutional management to develop practical methods for MSI prevention, management, rehabilitation, education and research. Palac (2008:20) describes the multidisciplinary roles in her interdependent model, which includes somatic practitioners:

> Health professionals diagnose and treat musicians with music-related physical or psychological disorders; music teachers provide pedagogy that is founded on sound musical, psychological, and biomechanical principles; and movement and somatic specialists provide knowledge of the body in music making.

Rickert, Barratt and Ackermann (2015:13) identify the crux, which is to create equal partnerships between health professionals and musicians. The challenge will be to sustain these working collaborations with reciprocal understanding, because:

> medical researchers need to understand the realities of instrument and art, just as instrumental teachers need to relinquish their long-held monopoly over how bodies and instruments combine in the creation of music.

However, there are numerous practical challenges as pointed out by Palac (2015:29): most medical doctors and researchers only see musicians after they have been injured; music teachers do not have musicians' health training; and most music colleges do not have access to health professionals. Palac (2015:29) therefore proposes that "local multidisciplinary health networks and teams can be part of the solution", and should be comprised of health professionals, musicians and somatic educators, who are mutually respectful of each member's expertise, and who are sincerely committed in terms of their involvement. As an example, she describes the Musicians' Wellness Team at Michigan State University (MSU), which includes two doctors, two physiotherapists, an Alexander Technique (AT) teacher, a psychologist, and two voice specialists. The team meets regularly, plans classes, does research when feasible, triangulates knowledge and has also set up a referral network of allied health practitioners in the local community (Palac 2015:29). The four comprehensive principles of the programme are: "Creating Awareness, Accepting Responsibility, Providing Access and Taking Action" in order to attain "Musical Health and Enhanced Performance". Palac (2015:29) elaborates on the thorough and highly-functional structure: awareness is enhanced through coursework in musicians' occupational health and classes in somatic education. Music faculty and management take responsibility for implementing prevention and reducing risk. Students are assisted in gaining access to appropriate healthcare professionals and local resources through referrals and interdisciplinary collaboration. These three foundational elements facilitate student empowerment enabling "health-promoting performance and lifestyle practices and behaviours" (Palac 2015:30).

Similarly, Miller and Moa (1998) are of the opinion that an on-campus arts multidisciplinary clinic treating student dancers, musicians, drama students and visual artists proved to be extremely effective for diagnosis and treatment. The team approach included a doctor, a counsellor, a nurse, and physiotherapists experienced in performing arts medicine, enabling early intervention and decreasing time off from studies. Psychological support, as well as working with the teachers and correcting practising approaches and techniques, added to the success (Miller & Moa 1998:124).

The Student Advocate Scheme (SAS) is an example of a unique collaborative initiative run by BAPAM. It is a model for health promotion within several performing arts colleges and is carried out by student advocates with the goal of education, advocacy and support. Student advocates report that it enables more openness so that fellow-students with PRHPs seek advice on rehabilitation and the issue is taken more seriously by the institution (Norton 2013:70).

Clark, Williamon and Redding (2013:498) also recommend an interdisciplinary and collaborative approach utilising anatomy, physiology, biomechanics, psychology, health and behaviour. They report on the objectives of the screening programmes for music students that are being developed by Conservatories UK. These are shown to be valuable not only in terms of informing the health-related content of curricula, but also for assessing the impact of health interventions.

This leads to the topic of the evaluation of health-promotion and injury prevention programmes. Research on the effectiveness of educational interventions will be the focus of the following section.

3.2.4 Effectiveness of Tertiary Musicians' Health Education Interventions

Confirming the urgent need for more specific research on the effectiveness of interventions, Manchester (2014b:180) points out that only a few recent evaluation studies have been done in comparison to the extensive volume of similar research in sports and occupational medicine. Spahn, Hildebrandt and Seidenglanz (2001:30)

comment on the need for larger, controlled studies with randomised designs. Table 3-1 illustrates nine studies in which the effectiveness of tertiary musicians' health interventions was assessed. It is evident that musicians stand to benefit from participation in health-related courses. The table highlights a range of positive outcomes, as well as some of the challenges faced.

Table 3-1: Effectiveness of tertiary musicians' health education interventions

STUDY	DESIGN	PARTICIPANTS	INTERVENTION	FINDINGS
Laursen and Chesky (2014)	Quantitative (pre- and post-intervention questionnaires)	29 music education students at University of North Texas (UNT)	Occupational health coursework included in a regular brass teaching methods course	Significant increases in students' self-reported awareness, knowledge, and competency. Moderate increases in responsibility.
Ingle (2013)	Quantitative (pre- and post-intervention questionnaires) Some qualitative feedback on course content	25 music performance students at the Australian National Academy of Music (ANAM) (High attrition rate: only four participants completed the course with many reporting online accessibility and scheduling problems).	Online health promotion and injury prevention course	Low response rate prevented conclusive results. Students' qualitative feedback indicated a preference for face-to-face classes with an exercise component.
López and Martínez (2013)	Quantitative (pre- and post-intervention questionnaires)	90 tertiary music students in Salamanca, Spain in the experimental group, and a control group of 59 students	Health promotion and injury prevention course	Body awareness improved by 91% and injury frequency decreased by 78% compared to the control group who had no improvements.

STUDY	DESIGN	PARTICIPANTS	INTERVENTION	FINDINGS
Lee, Carey, Dubey and Matz (2012)	Quantitative (pre- and post-intervention questionnaires)	15 university music students	Health programme of physiotherapy and yogic breathing exercises	Students had improved physical efficacy by improving posture, tension and movement ease. Post-intervention observation showed more musically expressive playing, however, in the self-reported data, there were no differences between pre- and post-assessments in the music students' discomfort or performance efficacy perceptions.
Su, Lin, Tang, Su and Chen (2012)	Quantitative (pre- and post-intervention questionnaires and one-month follow-up)	15 postgraduate music students in Taiwan	Online health promotion and injury prevention course	Improvements in students' knowledge of practice and performance aspects but not as effective for general health and lifestyle issues. Researchers noted the need for high-speed Internet to observe playing and the need for individual confidential sessions.
Zander, Voltmer and Spahn (2010)	Quantitative (Questionnaires: post-intervention and one-year follow-up)	247 first- and second-year music students at the Freiburg Music University, split into an experimental (n=144) and control group (n=103)	Occupational health course	Improvement in psychological symptoms No reduction in pre-existing physical symptoms
Barton and Feinberg (2008)	Quantitative (pre- and post-intervention questionnaires)	26 first-year music students	Health promotion and injury prevention course	Students' knowledge and implementation of strategies improved.

STUDY	DESIGN	PARTICIPANTS	INTERVENTION	FINDINGS
Hildebrandt and Nubling (2004)	Quantitative (Pre- and post-intervention questionnaires)	Music teachers and their students at Winterthur Zürich Conservatory (tertiary and pre-tertiary students)	Course for music teachers on injury prevention, efficient movement, constructive teaching skills, and performance psychology	The teachers reported that they became more skilled in their teaching and in attending to their students' playing movements. The students observed that the teachers' style of teaching had changed in that they were clearer in terms of verbal instructions, and better at posture and movement corrections.
Spahn, Hildebrandt and Seidenglanz (2001)	Quantitative (Pre- and post-intervention questionnaires)	22 music students at Zurich Conservatory in the experimental group and a control group of 22 students	Health promotion and injury prevention course	Mainly positive results on psychological outcome measures, certain physical outcome measures, and improved study coping skills. Students' feedback was highly positive.

Ingle (2013:51) found that students' perceived knowledge of healthy playing habits and injury prevention was quite high, but paradoxically, their health promotion behaviours were deficient, suggesting that they "consider injury prevention as secondary in importance to performance, practice and other demands on their time". The logistical challenge of accommodating health-related courses in music students' schedules was evident (Ingle 2013:51; Lee et al. 2012:93). Lee et al. (2012:93) therefore suggested the incorporation of health-related content into a performance education course. Likewise, Laursen and Chesky (2014) incorporated playing-related health and injury prevention into a teaching methods course since these are stipulated course requirements. According to Laursen and Chesky (2014:137), "connecting pedagogy to health concerns may help to empower future teachers while addressing the need for prevention and early intervention. This concept is often applied in physical education courses and sports". The study by Hildebrandt and Nubling (2004:62) supports the notion that courses of this nature for qualified music teachers are

beneficial for their music students in that they have a positive influence on the skill of the teachers and on injury prevention. Barton and Feinberg (2008:47) highlight that the success of such a programme is associated with the positive support and collaboration of the music faculty. Somatic education was included in five of the nine interventions (Lee, Carey, Dubey & Matz 2012; Su, Lin, Tang, Su & Chen 2012; Zander, Voltmer & Spahn 2010; Hildebrandt & Nubling 2004; Spahn, Hildebrandt & Seidenglanz 2001). The effectiveness of the health courses and interventions points to the need for their inclusion as a required part of the curriculum of tertiary music studies.

There are a number of courses being taught worldwide (see Addendum A[27]) and, while they share common essential content, various aspects differ such as curriculum, lecturers and mode of delivery, all of which are dependent on their local contextual requirements and possibilities. Overall, however, scholars agree that integral elements of tertiary education in musicians' occupational health include body and movement awareness and biomechanical principles for injury prevention as well as optimal performance. In view of this acknowledgement, the section that follows considers Body Mapping for musicians as the somatic component of musicians' health coursework.

3.3 BODY MAPPING FOR MUSICIANS

Body Mapping for musicians (BMg)[28] may be an appropriate way to address the posture, movement, proprioceptive, biomechanical and anatomical components of health education for musicians. The foundation of BMg lies in the Alexander Technique (AT), a somatic method which has been practised by performing artists since the early 20th century (Buchanan & Hays 2014:3). Before examining BMg, it is necessary to

[27] See Addendum A: Musicians' health promotion courses at tertiary institutions
[28] The abbreviation 'BMg' is used for Body Mapping because the abbreviation BM is already in use for several other medical terms.

provide insight into the field of somatic education and practices as both the AT and BMg draw on the rich history of and established knowledge on somatic methods.

3.3.1 The Field of Somatic Education and Practices

Somatic methods or 'Western body-mind disciplines' are "ways of working with the body that are therapeutic, educational, creative, and physically expressive", and utilise "movement awareness 'exercises'[29] or 'experiences' derived from a certain educational lineage" (Mullan 2014:253). Eddy (2009:6) outlines the history of somatic practices, noting concurrent developments in psychology, cultural studies, existentialism and phenomenology. This includes the work of FM Alexander, Feldenkrais, Laban/Bartenieff, Dalcroze, Gindler, Mensendieck, Middendorf, Rolf, Todd, Trager, Rosen, Pilates, Sweigard, Bertherat and others. These somatic pioneers "discovered that by being engaged in attentive dialogue with one's bodily self we, as humans, can learn newly, become pain free, move more easily, do our life work more efficiently, and perform with greater vitality and expressiveness" (Eddy 2009:6).

Whereas some somatic methods focus on therapeutic touch, several either use experiential movement, are educative, or combine touch, movement and education (Eddy 2009:7; Mullan 2014:254). Integral goals include the development of proprioceptive and kinaesthetic awareness, improving movement coordination and integration, self-perception in relation to the environment, and identifying habitual patterns (Eddy 2009:9).

The terms 'kinaesthesia' and 'proprioception' are essentially synonyms and are often used interchangeably in the literature. However, whereas kinaesthesia tends to be more focused on movement perception, proprioception places more emphasis on posture and position (Carpinteyro-Lara 2014:7; Stillman 2002:668; Galvao & Kemp

[29] Within somatic approaches, the term 'exercise' is used cautiously, as it may be interpreted as implying mindless and disembodied movement work. The use of the term movement 'exploration' is therefore often preferred for an application of a somatic nature.

1999:131; Batson 1996:3). Smitt and Bird (2013:471) provide the following comprehensive description of proprioception:

> Proprioception includes the ability to detect joint angle, muscle forces, muscle fibre length and velocity, which, in turn, enables the central nervous system to receive unconscious and subconscious feedback to perceive spatial relationships and initiate coordinated movement. Proprioception should enhance efficiency of movement by reducing unnecessary muscle recruitment so that movements can be performed correctly and economically, following the technical and aesthetic requirements unconsciously.

The goals of somatic methods, such as the AT, the Feldenkrais Method (FM) and BMg are to improve biomechanics through the achievement of balance and alignment, promote awareness of the link between mind and body, reduce unnecessary tension and effort, and increase efficiency (Carpinteyro-Lara 2014:23; Speck 2009:49). Somatic work therefore involves improving movement patterns and habits in a holistic mind-body and body-mind experiential process of psychophysical integration. Highlighting the psychophysical aspect of sensory awareness and movement re-education in somatic methods, Eddy (2009:8) explains:

> The goal of the somatic movement professional is to heighten both sensory and motor awareness to facilitate a student-client's own self-organization, self-healing, or self-knowing. Movement includes the subtler movements of the breath, the voice, the face, and the postural muscles, as well as any large movement task, event, or expression.

In elaborating on the inseparability of mind and body, and the significance of bodily experience in musical perception, Bowman (2004:30) states that "all human knowledge draws its sustenance from corporeal roots. Mind is inextricably biological and embodied; and what it can know is always grounded in the material and experiential world". Using the terms "mindful bodies" and "embodied minds" in his discussion of the embodied view of music cognition, Bowman (2004:36) explains how perception and action are so inseparable and mutually informative that "the mind is in the body" and "the body is in the mind".

Yet the historically established philosophical and theoretical trends may well place the aesthetic, cognitive and abstract aspects of music in direct opposition to the

performativity of musical action and music as an embodied phenomenon (Bowman & Powell 2007:1088). Bowman and Powell (2007:1105) describe music as "a form of embodied agency", arguing that "things like melodies, rhythms, and textures are as much muscular as they are mental. Whatever else music may be, it is invariably a bodily fact" (Ibid. 2007:1095). Nijs, Lesaffre and Leman (2009:133) similarly advocate an embodied approach to music pedagogy. They refer to the flow state as an optimal embodied experience when a musician is fully immersed in the experience of creating the music. The instrument becomes a natural extension of the body and is therefore integrated as part of the body schema.

Batson & Schwarz (2007:48) describe how the enhanced sensorimotor perception from somatic practices enables "a more psychophysical state of embodiment conducive to coordinated action". Improving embodiment[30] is a key component of all somatic methods, such as the AT, the FM, Tai Chi, yoga, mindfulness meditation and body-oriented psychotherapy as they cultivate non-judgmental mindfulness, interoception and proprioception. Mullan (2014:258) refers to the underlying philosophy of somatics as supporting the 'whole person' and the lived embodied experience. This biopsychosocial stance is illustrated by Mehling, Wrubel, Daubenmier, Price, Kerr, Silow, Gopisetty and Stewart (2011) who explored the perspectives of somatic method practitioners and patients with regard to their understanding of body awareness. Findings revealed that body awareness and embodied self-awareness were inseparable and that the unity of the body-self dialectic, as expressed by phenomenologist philosophies, in fact became a more integrated 'trialectic', incorporating individuals, their actions and cultural environments (Mehling et al. 2011:11). A model such as this "overcomes the mind-body split, as it still persists in the biomedical model, and integrates the phenomenology of complex mind-body interactions" (Ibid. 2011:12).

[30] Embodiment in this sense refers to an integrated bodily connectedness and awareness, understood as firmly situated in lived embodied experience, acknowledging the inseparability of mind and body.

According to Buchanan (2014:145), somatic practitioners enable the coordination of the mind and body in movement. Awareness is guided by the mind ('thinking') and can emerge from the body ('sensing') (Mullan 2014:256). Sensory-motor skills can be modified as a result of brain plasticity. Buchanan (2011:109) is of the opinion that "all somatic education disciplines place emphasis on the individual's responsibility for developing improved sensory awareness via kinaesthetic feedback and cognitive understandings". Whereas most biomechanical methods focus on modifying movement patterns from an external perspective, the AT and FM develop sensory awareness of ineffective habitual movements and the ability to correct these through integrated body use and mental intentions (Dommerholt 2010a:67).

Krasnow, Monasterio and Chatfield (2001:8) note the considerable anecdotal and experiential evidence supporting the benefits of somatic approaches in improving 'dynamic' body alignment "at the unconscious neuromuscular level", which is in line with research studies in motor control:

> The studies in the field of motor learning and motor control examine posture as an ongoing process of neuromuscular responses to disturbances, or perturbations, to balance.… Dynamic alignment is defined as an ongoing process of neuromuscular postural responses occurring at an unconscious level, and can refer to the body in stance or in motion, in a variety of conditions.

Posture can therefore be improved by means of somatic approaches, such as the AT, FM, Mensendieck, yoga, BMg and Pilates. These develop body awareness and balance, thus developing proximal stability and improved postural muscle sequencing.[31] Somatic methods enable awareness of good spinal alignment, with stabilisation of the head, neck and trunk, allowing for optimal biomechanics with regard to limb functioning (Lee, Carey, Dubey & Matz 2012:86). Dommerholt (2010a:67) states that most musicians with music-specific inefficient movement patterns also

[31] Rietveld, Macfarlane and de Haas (2013:449); Lee, Carey, Dubey and Matz (2012:86); Foxman and Burgel (2006); Shafer-Crane (2006); Bejjani et al. (1996); (Zaza 1994).

demonstrate these in other activities, therefore requiring comprehensive movement awareness and postural retraining.

Buchanan (2011:108) argues that because somatic practices focus on neuromuscular and postural improvements, they are beneficial to musicians' movement efficiency, improved performance and injury prevention. Injury preventative approaches, which include somatic methods, relaxation techniques and movement explorations, have shown positive results because they target the common risk factors in musicians' PRHP, such as poor posture, overuse, perfectionism and extreme pressure to succeed (Spahn, Burger, Hildebrandt & Seidenglanz 2005). The kinaesthetic, cognitive and emotional aspects of postural patterns are highlighted through the kinaesthetic re-education of somatic approaches, thereby impacting the individual's body-mind reciprocal associations (Lee, Carey, Dubey & Matz 2012:86).

According to Lister-Sink (2005:21), the AT, BMg, and FM offer musicians a way of developing kinaesthetic awareness, improved coordination and biomechanical understanding. In her discussion of a somatic approach to instrumental pedagogy, she emphasises whole-body coordination; efficient biomechanical principles; acquisition of technique through the kinaesthetic, tactile, aural and visual senses; the consideration of a holistic (physical, mental, and emotional) teaching paradigm; and environmental and ergonomic factors. Lister-Sink (2005:23) claims that a healthy approach to technique:

- Prevents discomfort, fatigue, strain and injury;
- Promotes a sense of physical well-being while playing;
- Enhances suppleness, speed and facility;
- Increases tonal power;
- Broadens dynamic range and tonal palette;
- Promotes greater concentration;
- Reduces performance anxiety; and
- Keeps us fully available for listening and music making.

It is evident from the literature on musicians' health courses that the AT, FM, yoga, Dispokinesis, Mensendieck, and BMg were mentioned as the various types of somatic

education components offered.[32] Rardin (2007:7) observed the gradual acceptance and recommendation of the FM and AT as optional holistic injury-prevention approaches at some conservatories. In a survey on health behaviours and preventative habits among music students, the AT and the FM were the most frequently used somatic practices, and roughly one third of the participants reported using one or more somatic approach (Spahn, Richter & Zschocke 2002:24). According to Buchanan (2011:71), research has shown that musicians utilise somatic approaches, such as the AT and the FM, more than others, perhaps due to their compatibility with performance and "documented connections to the needs of musicians". Similarly, Wong (2015:3) states that the AT, FM, and BMg are the most popular somatic approaches among musicians. However, although somatic practices are utilised by some music teachers and in some music education settings, Paparo (2015:2) notes that they are very rarely embedded within music education curricula.

In the dance arena, somatic approaches are beneficial to improved coordination, movement efficiency, injury rehabilitation, enhanced expression and spatial awareness, and proprioceptive and sensory development (Batson & Schwartz 2007:49). A significant principle of somatic education is the need to balance rest with activity, which may be at the core of the differences in philosophy underpinning much dance and somatic education. A culture of rigour, discipline and effort tends to dominate dance pedagogy, with an emphasis on the motor aspect of the sensorimotor system, whilst somatic practices include and enhance the sensory aspect (Batson & Schwartz 2007:55). All of the aspects related to their discussion can be transferred to music pedagogy and the potential value of incorporating somatic instruction.

Smitt and Bird (2013:469) point out that proprioceptive training for musicians and dancers is important in that it enhances quality of movement. Movement quality is vital for musicians as it is "the key to musical expression and communication" (Buchanan

[32] Palac (2015:29); Zander, Voltmer and Spahn (2010:55); Manchester (2007a:29); Manchester (2007b:80); Manchester (2007c:116-118); Williamon and Thompson (2006:426).

2011:90). In her overview of somatic approaches such as the AT, the FM and yoga as tools for developing the perception of movement, Schlinger (2006:865) explains that "the ultimate goal of all of these is to help the performing artist connect the artistic process with non-injurious integrity of movement". Similarly, Macritchie and Zicari (2012:636) studied the connection between artistic intention and physical gesture in pianists, and concluded that movement efficiency and awareness of tension in the limbs was paramount, and changed according to the performer's musical intention. Schlinger (2006:865) elaborates on intentional movement as the core of musical artistry for vocalists and instrumentalists, describing how "the performer's movement expressly elicits and affects the sound of the instrument". The body and its movement create the sound; therefore, movement awareness and re-training practices are beneficial to musicians (Hildebrandt & Nubling 2004:63).

Meinke (1998:60) states that inappropriate use of force and inefficiency, which cause injury, also show that the musician is uncertain about the tone control of his or her voice or instrument. Learning about tone production, with efficient biomechanics and balanced and appropriate muscle contraction of the most effective set of muscles, is essential. A clear understanding of this will allow the musician to be free to develop the finer nuances of performance. It becomes a 'fine-tuning' of control of the exertions needed once "the basic production of sound has been made easy and comfortable – and more or less automatic" (Meinke 1998:60).

Woodard (2009:153) emphasises that understanding movement perception will also improve a musician's sense of embodiment which is essential for music-making. Palac and Grimshaw (2006:877) are of the opinion that "as a group, musicians tend to be somewhat disembodied; their awareness of their whole selves extends almost exclusively to the parts involved directly with musical technique". Woodard (2009:155) refers to musicians as being "disembodied spirits", discussing the problematic notion of creative intent directed by a mind or soul as separate from the body; a creative spirit or intellect without corporeality. Conable (2000:40) emphasises "embodied thinking" and explains that "as sensory experience becomes increasingly refined and reliable and motor activity more relaxed and efficient, cognition is experienced as embodied,

not abstract. This is the perfect condition for playing". Similarly, and equally applicable to musicians, Cox (1990:8) differentiates between a kinaesthetic and an intellectual approach for actors. She refers to the kinaesthetic approach as 'feeling-knowing', which enables whole-body integration and awareness, where true embodied knowledge is obtained through sensorimotor experience, "the most intimate mode of knowing".

In discussing the cognitive, perceptual and sensorimotor integration needs of performing artists, Palac and Grimshaw (2006:883) add that "small losses mean huge impairments to musicians. …Motor planning without sensory integration is a lost cause, and yet much time and energy is spent putting the cart before the horse in therapy". Improving sensorimotor awareness is therefore fundamental for musicians as De Alcantara (2013:39) explains:

> You can't perform an act correctly until you've had the experience of performing it, and you can't have the experience without performing the act. This vicious circle, kept closed by faulty sensory awareness, is one of the great stumbling blocks of musical pedagogy – and, indeed, of life.

Efficient sensorimotor integration is vital for musicians, and proprioceptive and sensorimotor retraining, and linking auditory input with movement, are necessary parts of musicians' injury rehabilitation and prevention (Ackermann 2010:256). Having outlined the relevance of somatic practices to musicians, I will now appraise the South African literature on musicians and somatic methods.

3.3.2 South African Research on Musicians and Somatic Methods

Of the seven studies on musicians and somatic practices that were found, only two were conducted in the last 10 years. The application of the AT as a somatic approach was associated with all of these pedagogical studies. Three of the studies focused on vocal aspects, two on woodwinds, and two on keyboard (piano and organ). Boonzaaier (2011:iv) documented the application of the AT for organists, including a survey of organists' attitudes and perceptions of the AT. Hoberg (2008) found that MPA was

reduced in woodwind students after the implementation of AT principles. Bosch (1997:iv) studied the application of the AT to flute teaching and playing, specifically posture, breathing, embouchure and tone production. The findings demonstrate that the AT mind-body awareness principle of attending to the whole person and integrating psychological and physical aspects was essential. Habitual difficulties, such as postural issues, pain, tension and anxiety can be identified and reduced through the practice of the AT. Homann (1997) explored the benefits of specific principles of the AT in relation to piano technique. The aspects examined were: balanced posture and its effects on left-right hand coordination; the consequences of imbalanced posture and tension; the effects of improved awareness of habitual responses and ability to change; and integrating the AT into piano performance.

Theron (1994) investigated the development and freedom of the voice as a psycho-physical process; the freedom of the body and the mind; and explored aspects such as posture, sensory perception and psychological influences including stress, fear, motivation and expectations. The AT is discussed as a way for singers to integrate the body and the mind, integrate with the environment, and address tension, body awareness and unwanted habits. Pedagogical approaches such as being more process-oriented to develop awareness are highlighted. Activities used to integrate the various psycho-physical aspects are explained, such as characterisation, movement, imagery, drama and imagination. Cox (1990) explored the concept of physicality in actors' vocal training, specifically investigating the application of the AT. Lloyd (1986) investigated the application of the AT to vocal pedagogy and performance, utilising a case study approach and documenting how the AT benefited the singer.

As the AT was the only approach that had been studied, it is evident that there is a need for further research on a more diverse selection of somatic practices and the use of their principles relevant to the needs of South African musicians. However, before examining BMg, it is necessary to consider the AT specifically as therein lies the origin of BMg. The following section will describe the AT, its principles and terminology, and review the relevant research.

3.3.3 Alexander Technique

The AT is an educational somatic method using the teacher/student model rather than a therapist/patient approach (Jain, Janssen & Decelle 2004:811). It is taught in individual lessons and utilises touch and verbal coaching to correct maladaptive movement and guide the body into balance and alignment (Klein, Bayard & Wolf 2014:2; Schlinger 2006:868). Essentially, the AT teaches kinaesthetic skills to reduce dysfunctional movement patterns (Klein et al. 2014:2). Cacciatore, Gurfinkel, Horak and Day (2011:496) point out that the AT emphasises axial behaviour during posture and movement, improves the relationships in the neck and trunk, reduces unnecessary tension, and elongates the spine.

During AT lessons, the relationship between the head, neck and back is a primary focus, which, when in balance, leads to coordinated whole-body improvements in ‘use’, letting go of excess muscle tension, and improved ease of movement and breathing. ‘Use’ in the AT is used to denote the way in which one moves and behaves (Klein et al. 2014:2). Although much of the work focuses on posture, the intention of the AT is not to teach an external ‘good posture’ but is a psychophysical method for educating an individual in efficient whole-body use (Cox 1990:3). Bindel (2013:49) highlights the fundamental principle of the mind-body connection and points out that “the use of a part is reflected in the use of the whole”. The essential aims are therefore efficient ‘use’ and inhibiting ‘misuse’, together with allowing a space between stimulus and response to allow a choice regarding ‘use’. There is conscious facilitation of “expansion and flow”, and reduction of “tension and contraction” (Ying, Evens, Hashim & Chiat 2015:2414). Rosenthal (1987:55) describes this conscious learning process as awareness, inhibition and conscious control: awareness of habits, learning to stop, and then consciously ‘directing’ one’s whole self into change. According to Vineyard (2007:12), the AT “helps us learn to perceive ourselves more accurately”, thus enabling “an experience of improved mind-body connection”.

Carpinteyro-Lara (2014) and De Alcantara (2013) explain AT terminology, such as ‘primary control’, ‘faulty sensory awareness’, ‘inhibition’, ‘directions’, ‘end-gaining’,

‘means-whereby’, ‘use of the self’ and ‘constructive rest’ as follows: Primary control refers to the dynamic relationship between the head, neck and back, which when released and free of tension, guides the spine into balanced alignment. Poor sensory awareness refers to the fact that the kinaesthetic sense becomes adapted to the body’s habitual limitations, accepting tension, imbalance and restriction as correct. Alexander used the word ‘inhibition’ to refer to the ability to recognise a poor movement habit and to inhibit that habitual response. The ‘directions’ refers to focusing one’s attention on one’s head, neck and back to allow a lengthening and widening thereof. In ‘end-gaining’, the goal or end-result of one’s behaviour, activity or movement is the only focus, whereas using the ‘means-whereby’ involved remaining aware of the process as a skill or movement is accomplished, thus utilising kinaesthetic awareness. De Alcantara (2013:13) states that “simply put, it calls for you to create and employ the best possible means to achieve any given end”.

The ‘use of the self’ refers to the integrated use of the whole body/mind. One is therefore gradually re-educating the body in a psychophysical way. ‘Constructive rest’ is a tool used in the AT in which one lies in a semi-supine position, focusing on breathing, the kinaesthetic sense and working on one’s ‘use’ (Carpinteyro-Lara 2014; De Alcantara 2013). ‘Conscious constructive control’ is a process of self-observation to discover one’s habits, release unwanted muscular tension and develop better movement patterns (Bindel 2013:50). ‘Inclusive awareness’, also called a ‘unified field of attention’ in the AT, refers to cultivating a broader integrated awareness of the self and the environment in a flexible way (Chou 2013:44).

A review of the effectiveness of AT treatment for medical conditions by Woodman and Moore (2012:98) found that the AT was effective in treating chronic back pain and managing disability in Parkinson’s disease. It may also assist with improving balance skills in elderly patients, alleviate general chronic pain and improve posture, breathing and stuttering. A large controlled study by Little, Lewith, Webley, Evans, Beattie, Middleton, Barnett, Ballard, Oxford and Smith (2008:1) investigated the effectiveness of the AT, massage therapy, prescribed exercise and counselling for patients with chronic back pain. Long-term benefits were derived from one-on-one AT lessons from

registered AT teachers. Austin and Ausubel (1992:486) found that AT lessons were associated with improved respiratory mechanism function in healthy adult participants in their study.

The AT is frequently used by performing artists (Ying et al. 2015:2413) and many musicians claim to have found it beneficial in terms of overcoming poor postural and movement habits that limit performance or cause injury (Klein et al. 2014:8; Batson 1996:3; Kaplan 1994:193). Lehmann, Sloboda and Woody (2007:151) describe their view of the benefits of the AT for musicians:

> The technique has a distinctly philosophical component, emphasizing the unity of body and mind, but it also offers solutions to 'misuse' of the body through enhanced sensory awareness and physical training. Exercises largely focus on proper bodily posture, position of the head, and use of muscles when moving. The AT was not developed with stage fright in mind, but it is widely used by musicians to reduce unnecessary tension that accompanies anxiety. Some research attests to its effectiveness in improving heart-rate variance, self-reported anxiety, and positive attitude toward performance.

Also commenting on the psychophysical integration for performers, Chou (2013:184) suggests that the AT provides tools which allow musicians to be more connected to themselves, their instrument and the music. Chou (2013:147) related a personal experience, using inclusive awareness whilst playing, with the change in perception resulting in feeling "complete, all aspects of myself cooperating as a whole with each other and my environment, and thus becoming a conduit for the music I am playing…. It is as though I am not playing the music. It is playing me".

A rigorous research study by Valentine and Williamon (2003:93) found that AT training for musicians improved technical and musical quality of performance as well as body use in terms of several AT variables that were objectively measured, including head-neck-back relationship, upper limb and back, face and eyes, fingers, thought direction, inhibition and poise. Klein, Bayard and Wolf (2014:1) reviewed research studies on the effectiveness of the AT with musicians, and found that future studies with improved research designs are necessary. Although the AT was shown to be effective in treating MPA, results of the studies were inconsistent; overall conclusions on the effectiveness of the AT could not be determined.

The AT is taught at music colleges such as the Royal College of Music and the Julliard School of Music, and studies show less occurrence of injury and improved posture (Speck 2009:49). Cacciatore, Horak and Henry (2005:575) found that lessons in the AT substantially improved postural coordination, specifically automatic postural responses, and reduced lower back pain, but advise that further research is necessary on the exact mechanisms involved. According to Wong (2015:11), the AT may enable freer musicianship, due to an improved mental attitude during practice, with easier and more consistent performances.

Weiss (2005:viii) documented the application of AT principles to vocal technique. In addition to discovering AT principles in many established singing pedagogues' texts, she outlined an AT perspective on vocal topics, such as breathing, posture and approaches to practice and performance. Similarly, Rootberg (2007; 2011) wrote about the integration of the AT into vocal pedagogy. Fedele (2003:iii) investigated how AT principles could be applied to oboe pedagogy. Holm (1997) explored limitations in breathing in flute players, and the integration of the AT to improve breathing efficiency and ease. McCullough (1996) wrote a comprehensive study on the AT and violin technique, with special emphasis on the pedagogy of Paul Rolland. Chou (2013:185) studied the effects of applying the principles of the AT to playing the double bass, and found that physical limitations were reduced, tension and strain decreased, breathing during playing became freer, physical coordination became more balanced, stamina increased, ease and poise improved, movement became freer, and full emotional expression was enabled. In their study on pianists, Ying et al. (2015:2416) found that 14 weeks of AT lessons had a positive effect and significantly reduced tension levels in pianists during playing. Kaplan (1994) studied pianists' experiences of the AT, and found that self-image and confidence, as well as mind and body integration, had improved and that body awareness at the piano increased. Yoo (2015) researched the AT and its integration into the multiple simultaneous actions of organ playing, and found more fluid coordination in performance.

Yoo (2015:82) and Kaplan (1994:184) point out that the AT is an ongoing, long-term learning process. According to Yoo (2015:82), “the AT is not a ‘quick-fix’ solution to body issues experienced by organists, or anybody else, for that matter. It involves a very thorough if not radical rethinking of the body and our relationship to it, of how we use it”.

However, peer-reviewed, well-designed and controlled research, with standardised outcome measurement tools, on the AT is lacking. Much of the evidence on its effectiveness derives from case studies, clinical practice, self-reports and testimonials. Yet it has been practised all over the world for over a hundred years, and strong anecdotal evidence continues to support its use. It is clear that somatic methods such as the AT, which improve kinaesthetic awareness, can be beneficial to improving dysfunctional movement (Jain, Janssen & Decelle 2004).

So far, this chapter has explored the field of somatic education and practices in general, with specific reference to the AT since it forms the foundation of BMg. Having addressed the AT, its core principles and relevance to musicians, the discussion now continues with an in-depth examination of BMg, starting with its background.

3.3.4 Background of Body Mapping

BMg is an educational somatic method which can be integrated into music teaching and performance. It was developed by the cellist and AT teacher, William Conable, in the 1970s, who observed that students’ movements were consistent with their misconceptions of their bodies’ structures. He called this perception the ‘body map’, which is analogous to terms such as ‘body representation’ (Buchanan 2014:146; Woodard 2009:158). William Conable (2006:6; 1991:2) describes how our maps develop over time based on our experiences as well as our perceptions thereof. However, Conable (1991:2; 2006:6-7) asserts that “because these interpretations may not be accurate, the maps based on them may also not be accurate”.

The AT teacher, Barbara Conable (2000:5), further developed the self-inquiry method of Body Mapping for musicians, which she defined as “the conscious correction and refining of one’s body map to produce efficient, graceful, and coordinated movement”. Her vision was for music education to be placed on a secure somatic foundation, thus establishing BMg training for music teachers and performers to provide a musculoskeletal basis for musical technique in all genres (Conable 2003).

BMg is developed and promoted by the non-profit organisation, Andover Educators, which was founded by Barbara Conable in 1997 (Buchanan 2014:145). Andover Educators is the training, licensing and professional association for BMg teachers, which had 52 licenced Andover Educators in October 2010 (Buchanan 2011:6). The organisation is growing rapidly, currently comprising 81 licenced Andover Educators, 52 licensure trainees, and 42 affiliate members from the USA, Canada, Mexico, the UK, Belgium, Holland, Finland, Turkey, Korea, Japan and South Africa (V.B. Mulvey 2018 [President Andover Educators] pers. comm., 24 January).

Buchanan (2011:107) notes that all Andover Educators have knowledge of the fundamental concepts of the AT and that many are also qualified in somatic disciplines, such as the AT, the FM, Dalcroze, Pilates and yoga. Books on BMg, each with specific applications of BMg principles, have been published by various authors who are affiliated to the Andover Educator network, which caters for children (Johnson 2017); singers (Malde, Allen & Zeller 2017; 2013; 2009); music ministers (Jankowski 2016); collaborative pianists (Marsh 2014); artistic performance (Mark 2012); oboists (Caplan 2009); violinists (Johnson 2009); trombonists (Vining 2008); flautists (Pearson 2006); dancers (Gilmore 2005); pianists (Mark 2003); and all musicians (Conable 2000).

3.3.5 Essential Elements of Body Mapping

BMg is the only somatic practice which focuses specifically on the needs of musicians and “provides a foundation for educators to teach musical technique in combination with movement training” (Buchanan & Hays 2014:4). Musicians learn how to use their

bodies in more biomechanically efficient ways by being taught relevant anatomical information and sensory awareness skills. Aspects, such as the kinaesthetic sense, an integrated sensory awareness, places of balance in the body, the movements related to breathing and those of the limbs are addressed (Woodard 2009:159).

BMg has its origin in the AT. The two practices have many similarities in that both retrain movement and kinaesthetic sensitivity, and develop balanced efficient movement. The difference between the two methods lies in the mode of movement re-training. Whereas the AT relies on extensive hands-on movement work, a BMg teacher does not engage in hands-on teaching, but utilises visual aids, anatomical models, verbal instructions and demonstration, carefully observing the student to provide feedback with the purpose of bringing about changes in movement, facilitating the development of new proprioceptive sensations. Students learn and apply anatomical information to their movement, and develop and demonstrate sensory awareness relevant to playing an instrument or singing (Krayer-Luke 2009:36; Foxman & Burgel 2006:315; Matthews 2006:11).

While posture is often taught in music pedagogy, body awareness and kinaesthesia are often missing. The development of these abilities allows the musician to experience the embodied sensation and provides him or her with a proprioceptive understanding of their movement and posture, an awareness of unconscious incorrect assumptions about his or her biomechanics, and the capability to correct any faulty body maps. This may facilitate physically integrated and emotionally connected music-making and expression (Johnson 2009; Malde, Allen & Zeller 2009; Vining 2008).

Training kinaesthetic sensitivity and integrating sensory input (kinaesthetic, visual, tactile and aural) are therefore fundamental aspects of BMg, which enable musicians to learn the self-evaluation skills to examine, change and refine the neurological maps of the body's movement and structure. Some important points about the neuroscience concerning body maps therefore now need to be made.

3.3.6 Body Maps and Neurophysiological Connections

A central principle of BMg is understanding the neurophysiological connections that facilitate efficient and free body movement (Buchanan & Hays 2014:3). The neuroscientific terms for 'body map' are 'body scheme', 'neuronal representation' or 'internal representation'; neural maps of bodily structures and functions which govern movement (Nichols 2004:2). The concept of the body schema was originally proposed by British neurologists, Sir Henry Head and Gordon Holmes, in 1911, who found that "signals from your body's musculoskeletal system are carried into your brain to determine your posture and the position of your limbs… internal postural models of ourselves in conjunction with models of the surface of our bodies" (Blakeslee & Blakeslee 2007:33). Another pioneering neuroscientist was Wilder Penfield, who, during the 1930s, also developed knowledge with regard to the many motor and somatosensory maps (Buchanan 2014:148).

Nichols (2004:2) explains that "conscious representations of the musculoskeletal system will influence motor learning and planning, and will have downstream effects on the cortical maps in the executive areas of the primary cortex". There is, therefore, complex interaction between the maps in the sensory and motor area of the cerebral cortex, as well as with numerous other areas, including those involved in motor planning (Krayer-Luke 2009:9). The multiple, interconnected and flexible maps are described by Blakeslee and Blakeslee (2007:11) who state:

> Research now shows that your brain is teeming with body maps – maps of your body's surface, its musculature, its intentions, its potential for action… These body-centered maps are profoundly plastic – capable of significant reorganization in response to damage, experience, or practice.

In their discussion of sensorimotor maps forming a 'mental picture' or 'body schema' of the body's muscles, bones, joints and tendons, Blakeslee and Blakeslee (2007:29) explain how proprioception "updates your sense of where you are in space and how your body is configured" with the result that "these maps guide your body movements and expectations about these movements". Body maps are linked to our

proprioception and can be altered via changes in sensory or motor experience, and via simulation or imagery. The somatosensory system includes both the proprioceptive and the tactile receptors in the musculoskeletal system and skin respectively. The proprioceptive and vestibular systems also interact with regard to movement, balance and head position (Krayer-Luke 2009:9).

Nichols (2004:2) confirms that body maps are dependent on one's sensorimotor experiences. Movement maps are therefore dynamic, activity-dependant and adaptive, and are "as individual as fingerprints" (Schwartz & Begley 2002:164). According to Schwartz and Begley (2002:212), "the brain's representations of the body, of movements, and of sounds are all shaped by experience". With reference to these continuous adaptive changes, Nichols (2004:2) explains the significance of teaching musicians about movement anatomy:

> In the case of a highly trained artist such as a musician, it is expected that the cortical areas become reorganized in a way that reflects the motor planning practices of that individual. …If movement is based on an inaccurate knowledge or perception about the anatomy of the body, then pathologic changes can result. These practices can lead to alterations in cortical representation, which can then become reinforcing of the faulty motor practice.

Conable (2000:5) observed that an inaccurate or inadequate body map correlated with inefficient and injury-producing movement, and that musicians with faulty body maps will be affected in some way, either through limitation or, if more severe, injury. As most musicians' limitations or injuries are movement-related disorders, the BMg method is an appropriate movement re-training approach for musicians, whose movement is so integral to their music-making. The refined, repetitive and intricate movements that musicians sustain, often for lengthy periods, will become injurious when they are not biomechanically sound. BMg is therefore recommended for musicians because it provides relevant anatomical and sensory information for musicians' movement retraining, enabling performance with sensorimotor coherence (Buchanan 2011:90). This leads us to explore the way in which BMg is taught and applied, by starting with training the awareness, the senses and movement.

3.3.7 Awareness, the Senses and Movement

In the practical and methodical process of BMg, musicians are first taught about proprioception and developing their body awareness. The importance of teaching musicians about body awareness as an aid to overcoming and preventing injury has been well documented (Schaefer & Speier 2012:320; Ackermann 2010:252; Burkholder & Brandfonbrener 2004:122; Krayer-Luke 2009:10; Schuele & Lederman 2003:19). Through BMg, musicians develop their sensorimotor awareness to learn to become more kinaesthetically perceptive and to be able to adjust movement when necessary, instead of routinely accepting or ignoring warning or pain signals (Buchanan 2014:155; Krayer-Luke 2009:19; Nesmith 2001:11). According to Nesmith (1999:74), “this process must necessarily become conscious as we change unconstructive behavior to constructive behavior. After a while, constructive behavior becomes the norm”.

Despite the undisputable fact that musicians’ movements create the sound, most musicians do not see themselves as ‘movers’, and awareness of movement is rarely taught (Johnson 2009; Conable & Conable 1995). Music is mainly defined by the sound, and musicians are usually trained to focus more on the sound itself than on the quality of their movement that generates it (Mark 2012; Johnson 2009). Yet the quality of musicians’ movements governs not only the quality of the musical sounds produced, but also, critically, their health in terms of aspects such as posture, biomechanics, tension, efficiency and the potential for injury (Mark 2012; Vining 2008; Mark 2003; Nesmith 2001).

The training of proprioceptive sensitivity is therefore a focus of the BMg method, and is imperative for musicians due to the link between movement and tone quality, and the risk of pain and injury from the repetitive motions (Krayer-Luke 2009:9). Uncoordinated muscular activity with excess tension during repetitive movements is a significant risk factor for injury. With enhanced self-evaluation and body awareness skills, musicians can address the issue of excess muscle tension and learn to play

with more biomechanical efficiency, correcting technique to be more poised and comfortable (Buchanan 2011:354).

Bindel (2013:55) writes: “A musician should be able to recognize the quality of her movement in order to regulate the amount of effort she exerts, such that effort appropriately matches the task”. Kinaesthetic sensitivity can be developed by encouraging self-inquiry and qualitative questioning in music teaching, such as “How am I doing this?” or “How does it feel”, resulting in descriptive and discerning answers such as supported or unsupported, free or tense, light or heavy, balanced or unbalanced, appropriate effort or excess effort (Malde et al. 2009:6). Technical facility and a greater expressive range are enabled through the musician finding balance and appropriate muscular exertion, with a choice of physical, cognitive and emotional responses available, and fluid, supported movements (Buchanan 2011:ii; Nesmith 1999). Buchanan (2011:90) asserts that “for musicians, effective movement is the key to musical expression and communication”.

Practising kinaesthetic sensitivity is only one aspect of body awareness. Buchanan (2014) and Bindel (2013) note the importance of promoting an integrated sensory awareness. The term ‘inclusive awareness’, which is derived from the AT and sometimes described in other literature as ‘mindfulness’, is used to describe this integration of the senses, perceiving self and world simultaneously and fluidly (Malde et al. 2009). The result is an ability to spread one’s attention gently and smoothly throughout the whole body, while acknowledging a spatial awareness, permitting one to shift one’s focus effortlessly as necessary (Marsh 2014:9; Caplan 2009:12; Malde et al. 2009:7; Pearson 2006:12). Pearson (2006:13) suggests that the muscular system is then able to diffuse the physical exertion in a flexible and coordinated way.

Refining the use of all the senses that musicians need is thus part of the BMg approach (Conable & Conable 1995:25). The tactile, auditory and visual senses are also cultivated in the context of whole-body awareness. In fact, a variety of other sensations, such as emotion, pleasure, pain, hunger, thirst and temperature all contribute to an integrated body awareness (Marsh 2014:9; Caplan 2009:12; Vining

2008:13). Marsh (2014:6) also emphasises the importance of including breathing in sensory awareness. Developing this inclusive attention, an integral principle of BMg, enables musicians to be fully 'present' in terms of physical, psychological and artistic awareness, thus enabling sensitivity to quality of movement and achieving embodied performance (Buchanan 2014:156; Pearson 2006:13). Conable and Conable (1995:21) wrote that:

> we develop the ability to bring body feeling into consciousness in a comfortable, ongoing way. Most people experience this as a kind of coming home. There is a relief in it, in becoming embodied again. It turns out the effort is not in feeling our bodies but in not feeling them.

As the musician's bodily connectedness is heightened through sensory integration and body awareness, musical embodiment and expression are facilitated. Body awareness thus becomes part of musical expression. As the musician combines musical intention with a clear movement intention, this further develops bodily connectedness, ease and expression (Marsh 2014:3). Barbara Conable (2000:48) states it very succinctly as follows: "When musicians conceive the sound they want to make they must also simultaneously, conceive the movement that makes it". All of this is possible in the context of inclusive awareness (Caplan 2009:12). The qualitative perception of movement is therefore vital for musicians: "Students cultivate the capacity for mindful music-making because they have been empowered with the knowledge and skills that enable them to make wise movement choices" (Buchanan 2011:33). Students are further enabled to make 'wise movement choices' as they learn how to access and correct their body map.

3.3.8 Accessing and Correcting Body Maps

Kinaesthetic perception is developed in BMg in conjunction with exploring and correcting one's body map. Questioning, correcting and refining a body map is possible because of neuronal plasticity, the brain's intrinsic capability for change. Plasticity is the continuous process of changing, adapting and re-organising the wiring of the brain (Pascual-Leone, Amedi, Fregni & Merabet 2005; Altenmüller, Gruhn, Parlitz & Liebert 2000).

Self-inquiry is an important part of the process of ‘re-mapping’ or correcting faulty body maps (Likar 2005:1). According to Krayer-Luke (2009:29), “to locate the source of inefficient (possibly harmful) movement, a musician should start by examining how they believe their body is constructed. A mental image should be formed”. Barrett (2006:35) explains this as becoming aware of unconscious assumptions about one’s biomechanics and then correcting any faulty body maps by being taught accurate relevant anatomical information. Simply put, when the body map is corrected, movement quality improves (Buchanan 2014:152; Woodard 2009).

One’s map of a certain part of one’s body, for example the spine, is very often unconscious so the first step in BMg is to access that map by asking questions, such as “What is my spine like?”, Where is my spine located in my body – front, middle or back?”, “What does it do?”, What is the length and circumference of my spine?” and “Which part of my spine is designed for bearing weight?” (Malde et al. 2009:16). One is inquiring about its structure, its location in the body, its function and size, even its role in breathing as these specific aspects enable one to gain a very clear and relevant practical understanding of the biomechanics without becoming overwhelmed by complex anatomy. It is also helpful and revealing to draw what the spine feels like within one’s body and to observe oneself playing or singing very carefully. The next stage is to correct and refine one’s map by assimilating accurate anatomical information from images and models, using a mirror, self-palpation and observing skilled and free performers, together with ongoing self-observation, self-inquiry, kinaesthetic awareness and qualitative evaluation (Malde, Allen & Zeller 2017:7; Buchanan 2014:153; Malde et al. 2009:4; Vining 2008:4).

The BMg process of comparing these conscious representations with musculoskeletal images and models, and checking for congruence, often reveals differences between the two, referred to as mis-mappings or mapping errors (Krayer-Luke 2009:31). Buchanan (2014:154) highlights the frequent kinds of misconceptions or mis-mappings that have a negative impact on movement and could possibly cause injury, including errors in the size of an aspect of the body map, structural mis-mapppings,

functional misconceptions, or vagueness, blankness or absence of a part of the body. For example, the spine is commonly sensed as being smaller and shorter than it is. Musicians who understand the real size and length of the spine will experience an increased sense of balance, strength and stability in their core. Buchanan (2014:154) states that “another common size mis-mapping is evident in people who habitually stoop or compress their bodies to fit their psychological self-concept of a smaller height and size than their actual physiological dimensions”. Structural misconceptions about the limbs, such as the arm having no connection to the clavicle and scapula, or the inaccurate locations of the carpometacarpal (wrist-finger) joints in the hands, frequently cause muscular maladaptive compensations. Clarifying functional mis-mappings in the body map, such as rib movement occurring only in the front, or forearm supination and pronation occurring at the wrist, enable freer and fuller breathing and the release of restrictive tension in the arm respectively. Regarding the vagueness of absence of a part of the body in the body map, William Conable (1991:3, 2006:9) identifies possible causes as lack of knowledge or the imitation of poor movement patterns. In some cases, injury, pain or trauma cause a withdrawal or loss of connection with a part of the body, which then requires appropriate psychotherapeutic treatment together with somatic work.

On this note, it must be acknowledged that a mandatory directive within the training of Andover Educators is the importance and necessity for musicians to consult medical professionals. Conable (2017a:2) emphasises that Andover Educators “are music educators, not healthcare providers. Please refer any musician in pain to a medical professional”. Andover Educators are musicians who are trained to teach the structured BMg course, ‘What Every Musician Needs to Know about the Body’. Having illustrated the background, principles, neuroscience, sensorimotor aspects, application and process of BMg, the researcher now offers a description of the course itself.

3.3.9 The Course: 'What Every Musician Needs to Know about the Body'

'What Every Musician Needs to Know about the Body' is a six-module BMg course taught by Andover Educators, as outlined in Table 3-2. It is taught in a variety of formats, depending on factors, such as the educational setting, the time available, the number of experiential activities, and the specific needs, number, age and level of the participants. The modular structure enables it to be taught in its entirety or as selected section/s. Presentations or workshops may be more detailed and extensive or shorter and more introductory in nature.

Table 3-2: 'What Every Musician Needs to Know about the Body' [33]

MODULE 1	Movement, the senses and awareness	Training musicians' movement by cultivating an accurate and adequate Body Map; training sensory discernment and responsiveness, and training an inclusive awareness
MODULE 2	The core of the body and the places of balance	The spine; the A-O joint; the lumbar vertebrae; the hip joints or sitting bones; the knee joint; the ankle joints and feet; the arm structure
MODULE 3	The arms	The whole arm, including the shoulder blade, collarbone, upper arm, lower arm, and hand
MODULE 4	Breathing	Mapping the structures and movements of breathing
MODULE 5	The legs	The three leg joints; buoyancy and energy from the legs and a stable, supported relationship with the floor
MODULE 6	Practical application in performance: putting it all together	Through individual and master class work, and an exploration of concepts in performance, students experience the application of the lecture concepts.

In order to illustrate the topics included in the BMg course, how it is taught and the students' experiential process, the six sections of the course will now be described in a condensed format. Selected examples of content, images and practical activities will be highlighted. In teaching the material, three-dimensional skeletal models, accurate anatomical images, and experiential movement and awareness activities are used. In

[33] Conable 2017a; 2017b; 2017c; 2017d; 2017e; 2017f; 2000.

addition, various educational movement anatomy videos and interactive software programmes are advantageous teaching tools.

3.3.9.1 Module 1

In the first module, the aim is to train awareness or attention, all the relevant senses (not just hearing) and movement (Conable 2017a:3). The other senses that are important for musicians are the tactile, visual and aural senses. The vestibular system is also explained in this module to enable an understanding of the interactions between the visual, kinaesthetic and vestibular processes in maintaining balance (Conable 2017a:31).

The concept of understanding movement as central to what musicians do is taught. The fact that movement creates sound and that the quality of the movement of the entire body determines the quality of the sound is emphasised. As explained earlier, this is for preventing injury and enhancing performance. Conable (2017a:34) explains the rationale:

> Any teacher not training kinaesthetic perception of the movement of playing is not doing the whole job and is leaving students vulnerable to tension and injury and is also failing to secure for them the sensory feedback that will allow them to go on improving in their playing.

With regard to awareness, the desired state for a musician is one of integrated attention, which includes the self and the surrounding environment (Malde et al. 2017:13). Instead of a narrow concentration on one aspect to the exclusion of everything else, this state enables the skill of effortlessly shifting focus as necessary, within the broader facilitative awareness (Conable 2017a:45; Malde et al. 2017:12). The torch beam analogy is useful here: a narrow beam of torch light shines at close range on a very small area, compared to stepping back and having a broader beam of light illuminate a larger area, where relationships between elements can be understood. A classroom activity is to stare at a small detail on an object in the room, excluding all other visual and sensory input. The students can notice the resulting sensations they experience and compare them as they expand to a broader

awareness, including a wider visual perspective and an awareness of sounds near and far. An exercise for developing an inclusive awareness is to begin with the body and the peri-personal space, broadening it to include the stage and performance area and then acknowledging the entire space, including audience, backstage, ceiling and beyond.

Musicians can learn to integrate their kinaesthetic, tactile, aural and visual input, which creates a responsive and lively awareness. Sensory integration leads to specifically training the kinaesthetic sense. Kinaesthesia can be experienced through activities, such as holding the hand up behind the head and being able to sense its movement, position and size. Qualitative perception of movement is taught by asking a student to notice 'how' she moves, with descriptions, such as free or tense, balanced or unbalanced, easy or effortful, light or heavy, supported or unsupported, smooth or jerky, and rigid or flexible. The goal of these explorations is to enable the development of kinaesthetic sensitivity, to discern the quality and type of movement, and to respond by making the appropriate adjustment (Malde et al. 2017:9). Just as musicians are trained to utilise this process in their listening skills, such as when correcting intonation, they learn to transfer the process to kinaesthetic fine-tuning (Conable 2017a:36).

The concept of body maps, what they are, and the method of Body Mapping are then presented. (Please refer to the preceding section on accessing, correcting and refining body maps.) Sufficient and appropriate clarity and accuracy in a musician's body map is dependent on and related to his or her specific movement needs (Conable 2017a:16). For example, a singer may need more accuracy and refinement in the map of the vocal and breathing mechanisms, whereas a violinist will need a highly-refined and detailed map of the fingers, wrist and forearm (Conable 2017a:16).

The process of attaining an accurate and adequate body map includes developing an understanding of three important elements: structure, function and size (Conable 2017a:20). The spine is used in this module as an example to explore its structure, function and size. By using drawing and self-inquiry, students access their very often

unconscious maps or conceptions of their spines. They are then taught about the structure, function and size of the spine, using appropriate anatomical images, skeletal models, videos and movement activities (Malde et al. 2017:24-36).

The introduction of ‘Constructive Rest’ as a resource is recommended during this first module. It is a practice derived from the AT and, when practised regularly, becomes an effective way of enhancing kinaesthetic and inclusive awareness (Malde et al. 2017:58). It involves lying on one’s back on the floor on an exercise mat or blanket, with knees bent, feet hip-distance apart, feet flat on the floor, and head on a book or other slightly raised surface. Vining (2008:13-16) outlines five important steps for ‘Constructive Rest’: The first is to “cultivate a whole and integrated body awareness”. The idea is to explore your awareness of the tactile, aural and kinaesthetic senses, together with any emotions and other sensations. During the second step, the intention is to “come to the greatest degree of muscular freedom you can find in the moment”. At this stage, the experience is about using your kinaesthesia to reduce and release tension, to move around if you prefer and, perhaps, stretch or self-massage. “Work on the integrity of your breathing” is the third element, which can only occur once you have gained whole-body awareness and released muscular tension, and comprises consciously exploring the natural and reflexive movements of breathing. The fourth step is to “develop an accurate and adequate body map” and is a preparation skill to learn so that once you have learnt about Body Mapping you can apply it mindfully, using this stage to discover and review your body map, using your kinaesthetic sense, movement and self-palpation. The fifth and final aspect is to “put yourself in a right relationship with space”. This involves considering your spatial and body awareness, thus enhancing your ‘Inclusive Awareness’, which was discussed previously. This step, for example may also involve your imagination as you practise relating to an audience and a large concert space, using your integrated sensory awareness (Vining 2008:13-16).

3.3.9.2 Module 2

The second module comprises content on the places of balance and the core[34] of the body. The six places of balance (see Figure 3-1) are usually taught in the following order: The A-O (atlanto-occipital) joint (see Figure 3-2), lumbar vertebrae, hip joints, knee joints, ankle joints, and arm structure. Conable (2017b:35) reminds us that these six places of balance are selected:

> because five are at major joints and, therefore, loaded with sense receptors and crucially important to the body map. Because if musicians become accustomed to monitoring balance at those locations, they will quickly come to monitor the whole body for balance.

[34] The Andover Educator use of the word ‘core’ refers to the central skeletal structures.

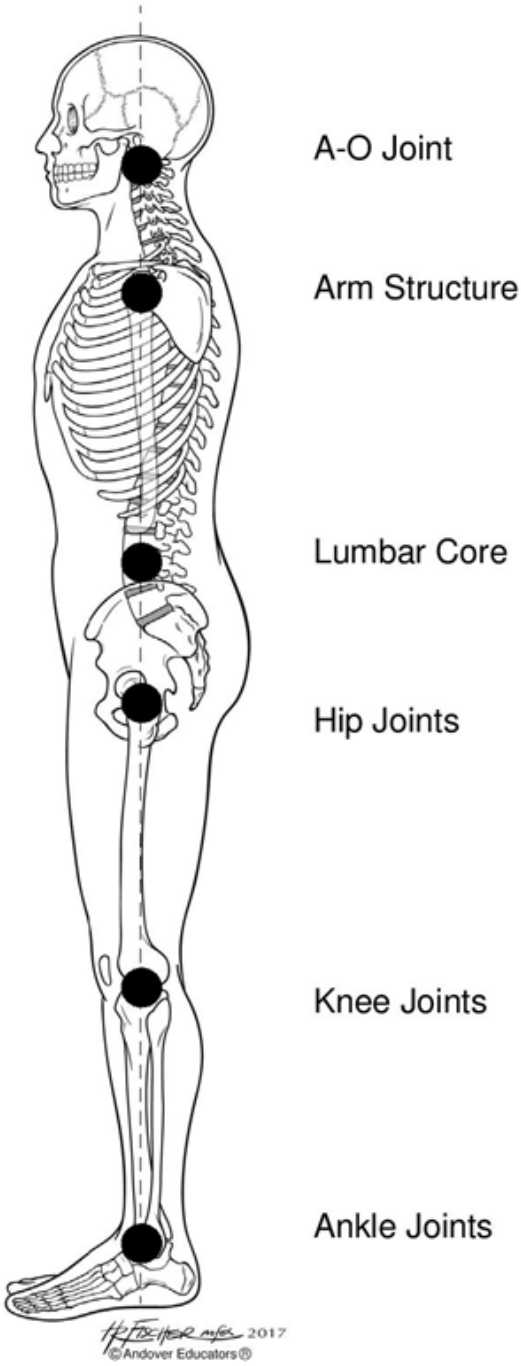

Figure 3-1: The places of balance (Andover Educators 2017)[35]

[35] The anatomical images used in this thesis, created by Holly Fischer, are owned and copyrighted by Andover Educators, and used with permission. Licensed Andover Educators have exclusive access and are entitled to use the images for their BMG teaching.

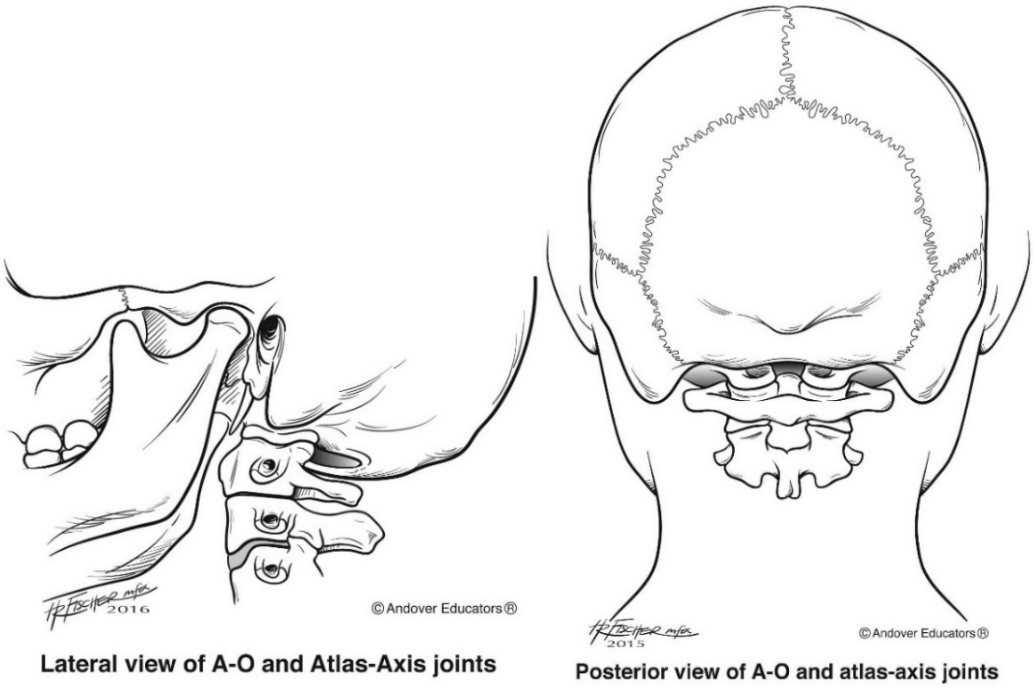

Figure 3-2: The A-O joint (Andover Educators 2016; 2015)

What is essential is that students will also be taught to internalise and locate the place of balance in the body by palpating the area, using their kinaesthesia, as well as through specific movement activities (Conable 2017b). Exploring awareness throughout the entire body can be done by means of a practical activity that uses a balance pad or similar unstable surface on which to stand. This should not be done with the instrument but is a good proprioceptive experience without it. An activity for the knee joints, for example, is exploring locked, balanced and bent knees (see Figure 3-3), always in conjunction with balance throughout the torso, particularly at the A-O joint and lumbar core (Malde et al. 2017:51).

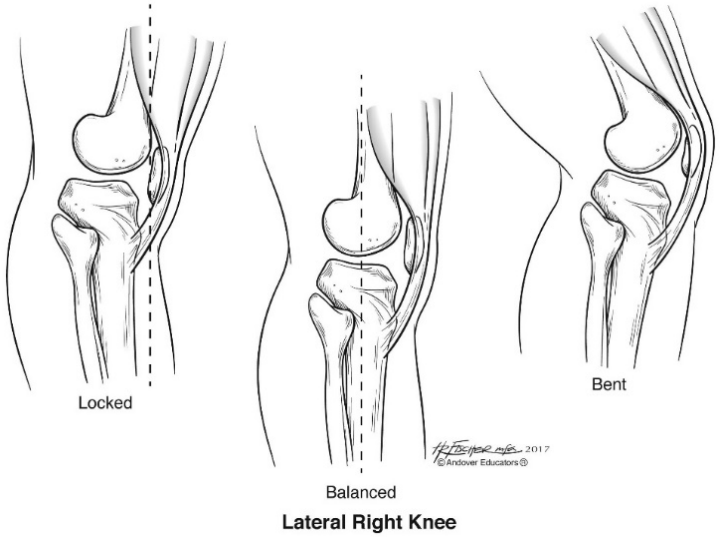

Figure 3-3: Locked, balanced and bent knee (Andover Educators 2017)

Through mapping the front weight-bearing and weight-delivering part of the spine as the central core throughout the torso, one is kinaesthetically able to find balance around the core (Malde et al. 2017:34; Marsh 2014:11; Johnson 2009:38). In his discussion of the subtle continuous adjustments which are part of balance, Vining (2008:26) states that "to be balanced is not to be rigid or unmovable. Balance is an ongoing, lively attribute, not the stagnant holding of a position. To be balanced is an internal sensation, not an external comparison to some abstract postural ideal".

The Collins dictionary (1988:771) defines posture in its first sense as "a position or attitude of the limbs or body" and in its second sense as "a characteristic manner of bearing the body". It must therefore be kept in mind that using the term 'correct posture' in music teaching, thus implying one correct position, is fraught with misunderstandings and difficulties. According to Conable (2017b:4), the words posture and relaxation can be problematic, as she explains: "Posture often means shoulders back, straight spine, and bottom tucked in. Relaxation is too general to be helpful, and often means collapse". Caplan (2009:17) comments that:

> It is common for teachers to observe a student slumping, and then ask them to "sit up straight." The student's usual response to this is rigidity. Or the teacher sees a student standing rigidly and asks them to "relax." Now the student begins slumping! For teachers to get what they're after, they should help students cultivate beautiful balance and kinaesthetic awareness.

Students, who conscientiously use the word ‘posture’, may feel and look stiff, rigid and uncomfortable (Malde et al. 2017:16). It can lead to over-extension and increased muscular tension, which then leads to complete collapse as the musician cannot hold that rigid ‘correct’ position for any length of time. In music teaching, it is far more helpful to use words which have a clear meaning, intention or movement description, such as balanced, free, supported, aligned, poised, alert or lively. A movement activity that can be used to teach this is to stand, sit, move or sing using the word ‘posture’ and then using the word ‘relaxation’. In the case of a group class, the students can also watch one another, as well as notice the sensations in their own bodies. The students may like to choose more descriptive and helpful words and try those for exploring the changes in kinaesthetic sensation. This activity can be done with and/or without instruments, and/or sound. A teaching goal in this section is also to correlate movement and sound; to “find the movements that create the best sounds”, because “many students tend to ‘set’ and ‘place’ the body, inhibiting movement and leading to physical and mental tension (Conable 2017b:5).

The neutral, balanced state that is most ‘easy’ and efficient is never locked. This means that standing still does not mean standing stiffly, but rather allowing the gentle micro-movements that are present as the student finds a fluid, natural balance (Malde et al. 2017:16). Conable and Conable (1995:28) describe micro-movement as all the sensations of activity in the body, including the subtle movements of breathing, stating that: “a free body feels like a body in motion even when it is in positions we usually categorise as still”. As students find a lively ongoing balance around the spine which includes subtle shifts and micro-movements, they are able to release unnecessary tension and holding. Over time, as they map the places of balance taught in BMg, they are able to find a sense of supported, dynamic, energetic poise without restriction and rigidity (Malde et al. 2017:9).

In terms of finding balance and the release of tension, it is also necessary to consider the inseparability of the physical and psychological aspects. Our emotional state and reactions to our environment can cause us to stiffen, pulling us off balance, and

interfering with ease of movement (Pearson 2006:16). Similar physiological symptoms are experienced in MPA, and increased muscular tension is a prevalent symptom thereof (Kenny 2016:3; Kirchner 2003:80).

The self-map of a musician is also addressed if appropriate and time permits, as musicians who experience injury or limitation (psychological or physical) need to consider and address their self-map as an artist (Marsh 2014:85-6). Conable (2017a:26) states:

> Years of distrusting their bodies, of sensing they cannot rely on it to move freely when needed can cause them to stop identifying themselves as 'talented', or as performing artists at all. It is this very self-map-as-artist that will motivate them to remain diligent through the challenging process of changing their maps until they arrive at a place where they can trust that freedom in their bodies will always be available to serve their highest artistic intentions.

3.3.9.3 Module 3

The arms are the focus of the third module. What is important in teaching the arm structure is that the whole arm includes the shoulder blade and the collarbone (Malde et al. 2017:228). A common misconception is that the arm exits from the side of the upper body, without shoulder blade or collarbone like a 'Barbie-doll' arm (Johnson 2017:19). The shoulder girdle should therefore be mapped as all the muscles that move the entire arm (Conable 2017c:3). The mapping of the four joints of the arm structure, including their movements, is vital: the sternoclavicular joint, humeroscapular joint, elbow joint, and wrist joints. The suspension of the arm structure from above, and an understanding and kinaesthetic awareness of how the spine supports the arms, are also important in this section. For example, considering the organisation of the arm from the tip of the little finger to the tip of the shoulder blade is helpful in terms of mapping whole-body support for arm movement. The integration of the arm with the back muscles such as latissimus dorsi can be seen in Figure 3-4.

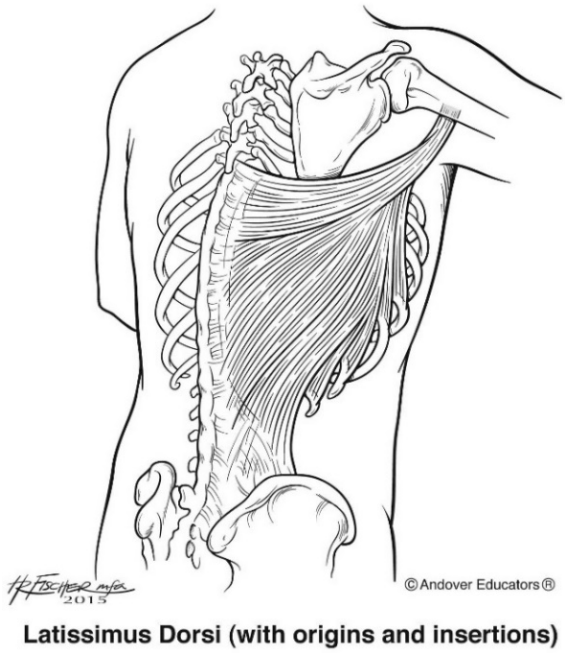

Figure 3-4: Latissimus dorsi (Andover Educators 2015)

Finding a balanced, neutral position for the arms around the core is an integral part of this third module (Johnson 2009:54), and several practical activities can be done to aid proprioceptive learning. One example is rotating from the sternoclavicular joint so that the clavicle and scapula go through their full range of motion, returning to neutral shoulder girdle balance at the centre (Malde et al. 2017:229; Caplan 2009:40). This activity also requires maintaining a kinaesthetic awareness of spinal balance as learnt in module two, such as in the lumbar spine and at the A-O joint (Johnson 2009:55). An example of a common misconception is that the arms may be mapped too low, causing compression between the clavicle and the ribs (Caplan 2009:41). Mapping the neutral position of the scapula and clavicle, independent of the ribs, is beneficial, and self-palpation of the movements of the clavicle and of humeroscapular rhythm, such as in swimming motions, is also a suitable activity (Conable 2017c:18; Johnson 2017:20; Malde et al. 2017:232). These various activities involving the scapula and clavicle can also be done in pairs to feel the range of movement (Conable 2017c:19). Similar activities can be done with the instrument to explore the changes in the sound (Conable 2017c:20). An example of this, for a wind or upper string player, is to bring the instrument to oneself from above, starting with arms raised and instrument up, which facilitates a neutral shoulder girdle without downward pull, stiffness, imbalance

or collapse (Johnson 2017:27). Correctly mapping the pronation and supination of the forearm is important (see Figure 3-5), as well as the neutral relationship of hand to forearm, the location of wrist bones, and the location of finger joints at the wrist. An example of a class exercise is to draw the bones of the wrist and fingers on the palm side of the hand (Conable 2017c; Caplan 2009).

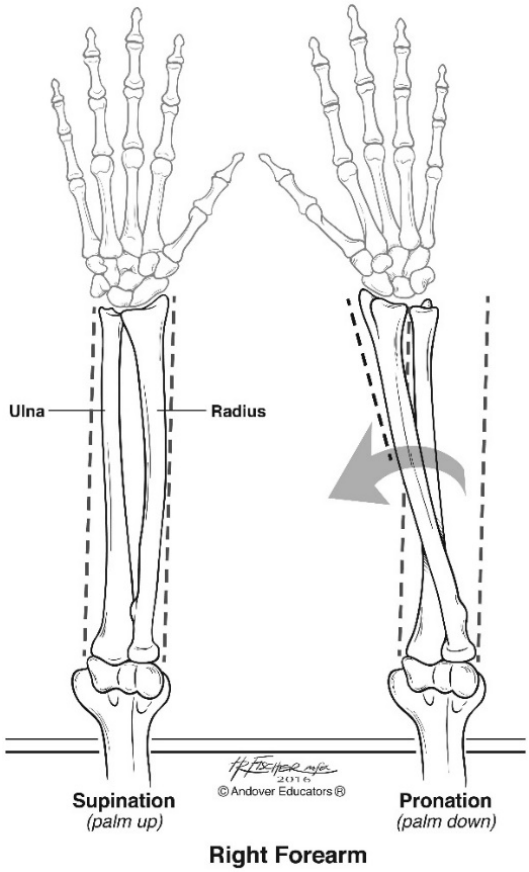

Figure 3-5: Rotation of the forearm at the elbow joint (Andover Educators 2016)

3.3.9.4 Module 4

The content of section four focuses on the structures and movements of breathing. Key elements include “the location of the lungs; the fact that ribs move, increasing thoracic volume; the fact that the diaphragm is active on inhalation, not exhalation; the fact that no air goes into the belly” (Conable 2017d:1). An understanding of whole-body dynamic balance and efficiency of movement, integrated with the kinaesthetic perception of the movements of breathing is an essential part of the learning outcome

of this module (Malde et al 2017:66; Vining 2008:39). Particularly important for singers and wind players is understanding the structure, function and size of the tongue (Caplan 2009:95-106), and also that freedom in the tongue, jaw and neck muscles depend on one another (Conable 2017d:9;). The hyoid bone, larynx, jaw and facial muscles must be mapped clearly, particularly the location of the temporomandibular joint (Johnson 2009:150). Experiential activities include self-palpation and gentle release of the jaw, using gravity and observing the changing sensations in the breathing. Moreover, understanding that pharyngeal muscles are not active, but released during breathing enables quiet and free inhalation (Vining 2008:43). The location of the lungs and their depth from front to back (see Figure 3-6), the location and movements of the diaphragm, and the rib joints and movements are all explored (Caplan 2009:75-80; Vining 2008:44-51). Conable (2017d:22) explains an aspect of rib movement:

> The movement of all the ribs can be felt, monitored and controlled. When we need maximum capacity, only totally free-moving ribs will acquire it. On exhalation, the descent of the ribs can be controlled so they make a long, slow, even excursion across a long phrase.

Verbal review questions are also used frequently, and students are given time to self-observe and respond, for example: ‘Whilst breathing, what do you notice when you place your hands on your sides under your arms?’ Activities in pairs enable improved kinaesthetic and whole-body awareness, for example: two participants sit back-to-back on the floor and are guided carefully by means of instructions to enable efficient balance throughout the torso in sitting; they take it in turns to breathe deeply, while remaining conscious of and exploring the rib movements and increased thoracic volume in the back. A group exercise with four students, using all eight hands fitted together in synchronised movement is a participatory activity simulating the movements of breathing. Each pair of hands represents a component: ribs, diaphragm, abdominal wall and pelvic floor.

Also included in this module, therefore, are aspects, such as the pelvic floor, the movements of the abdominal wall (front, back and sides), spinal mobility and support.

Conable (2017d:29) posits that “abdominals actually do work during the movement of breathing, but in coordination with the whole body”. Spinal mobility refers to the deepening and widening of the torso on inhalation as the spinal curves deepen, and the lengthening thereof on exhalation (Marsh 2014:21). The release of tension in the neck muscles is essential for free breathing. Therefore, the consolidation of dynamic neutral balance in the body is a recurring theme during the breathing module. ‘Dynamic neutral’ balance of the arm structure and good humeroscapular rhythm are also important concepts for ease in breathing because of the release of restrictive neck tension and freedom in rib movements. The interaction of the legs and pelvis with breathing is also taught because a frequent misconception is that the legs have nothing to do with breathing.

There is a great deal of content in this section that cannot all be presented in this overview. The amount of detail taught is always determined by the needs of the student/s, for example whether they are singers or wind players or string or keyboard instrumentalists. The information is consistently consolidated throughout by means of practical activities which can be done with and without the instrument or voice.

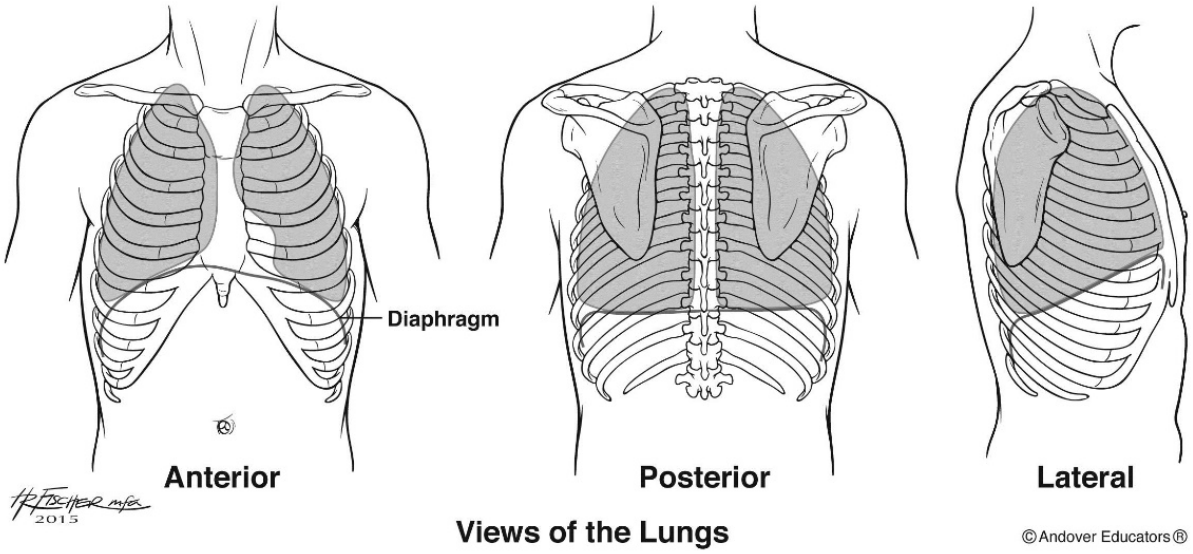

Figure 3-6: The location of the lungs (Andover Educators 2015)

3.3.9.5 Module 5

The movement of the legs is explored in module five (see Figure 3-7). As seen in the preceding discussion, the material is consolidated and reviewed continually, and fundamental concepts, such as efficient and dynamic neutral ‘posture’, are integrated with new topics that are introduced as the course progresses.

The interaction and coordination of hip joints, knees and ankles is taught, as many students will have mapped one of the three joints as more important than the other two (Conable 2017e:2). The hip joint is frequently misconceptualised as being at the iliac crest or at the greater trochanter. Much humour can be enjoyed in this class as students explore and observe themselves ‘trying on’ different mappings of the hip joint, and the ensuing movement results. The correct location and structure of the hip joint is once again taught, using skeletal models, images and movement explorations. The relationship of the pelvis (including the hip joints) to the spine is also considered (Conable 2017e:5). A movement activity in which the students lie on their sides, with the upper leg bent forward over the lower leg, permits self-palpation of the sitting bones, the hip joints, and the greater trochanter, as well as exploration of the range of movement at the hip joint (Conable 2017e:6). These types of experiential activities develop heightened kinaesthetic awareness, embodied knowledge and more accurate body maps. Bowing, as musicians do at the end of a performance, is a movement activity to experience the whole torso leaning forward from the hip joint. Many will have mapped this movement as occurring at the waist, resulting in a more restricted and awkward movement pattern (Vining 2008:106).

During the teaching of the knee and ankle joints, the structure, function and size thereof are covered, as well as ranges of movement, and a review of the relevant information from the balance module. Paired activities are suitable for knee movements, for example, the standing partner does the movements (see Figure 3), whilst the kneeling or sitting partner places his or her hands around the knee of the standing colleague (Conable 2017e:18). Much exploration of the bones of the feet and

ankle can be done by means of self-palpation guided by the teacher, as well as several types of directed walking activities (Conable 2017e:26).

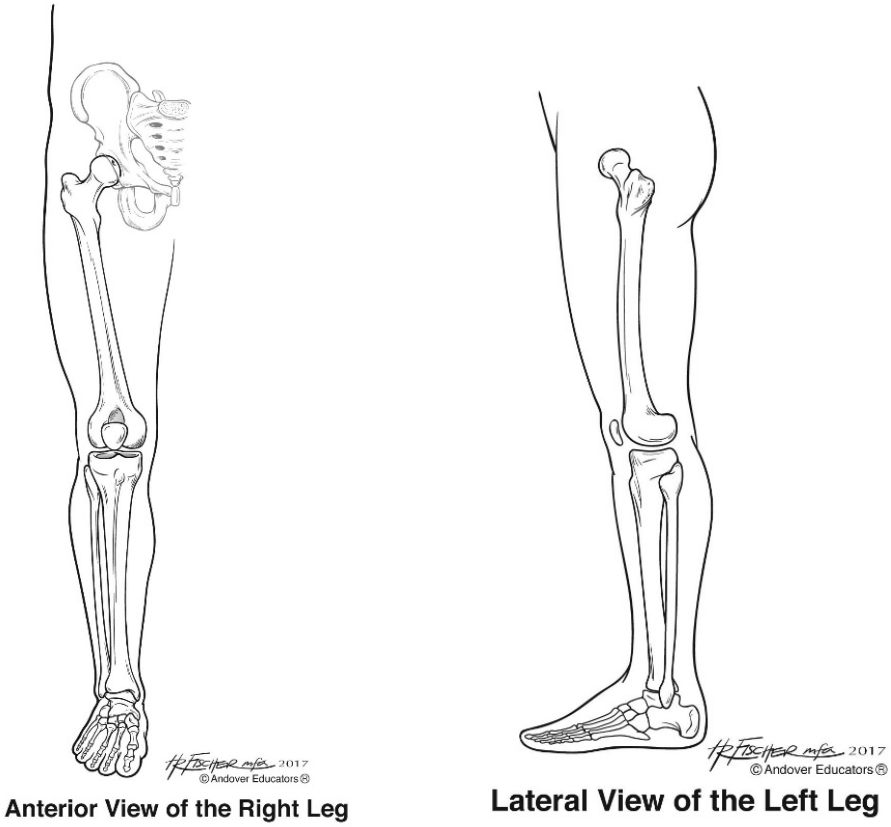

Figure 3-7: Anterior and lateral view of the leg (Andover Educators 2017)

3.3.9.6 Module 6

The sixth and final module is an opportunity to start putting the content of the course into practice through individual and master class work. In this session, the Andover Educator is trained to observe the student playing, singing or conducting to be able to help the student to correct BMg misconceptions by applying specific content from the course. An important principle is that this is not a lesson on instrumental technique, but on body use, to provide a basis for technique and technical choices. Conable (2017a:16) asserts that “Body Mapping is a foundation for technique. It is not technique itself”.

Conable (2017f:1) suggests that one should determine “what ... this student most need[s] to know”, in other words, what will make the biggest difference and have “the best effect over the longest period of time”. This is important since the teaching goal is not only about what can be easily and immediately assimilated, but how to empower students with tools so that they are able to integrate and develop the skills over time.

In view of the discussion on the origins, description and application of BMg, the following section will comprise a survey of the studies on BMg in order to position the present study academically. Eleven sources were identified, eight of which focused specifically on BMg, and four of which included BMg together with other somatic practices.

3.3.10 Research on Body Mapping

Pedagogical development and application studies (6) comprised the greater part of the literature. Holt (2016:iii) researched the application of BMg to trumpet playing to create a pedagogical resource for trumpet teachers and players, “debunking misinformation present in traditional trumpet pedagogy, providing correct and relevant anatomical information, and principles from which to apply this anatomy” (Holt 2016:65). Bindel (2013:ii) studied the application of BMg for collaborative pianists and devised a course for teaching collaborative piano skills together with good body use and awareness. Her research aimed to give collaborative pianists, who often face a large volume of music to learn quickly within a potentially stressful and busy schedule, a method to avoid injury and promote artistic freedom.

Copeland (2007) wrote about Body Mapping principles as specifically applied to clarinet pedagogy, investigating and clarifying common anatomical errors in traditional clarinet teaching. Similarly, Pearson (2000) outlined the application of BMg principles to flute pedagogy. Carpinteyro-Lara (2014) discussed a kinaesthetic approach to cello playing, incorporating the AT, FM, yoga and BMg. He explained that through development of the kinaesthetic sense, and therefore improved conscious body awareness, with skills to sense muscular effort, tension, relaxation, balance and

spatial orientation, cello playing became an integrated musical, physical, aerobic and intellectual activity. Kinaesthetic dysfunction frequently occurs when there is a learned insensitivity to kinaesthetic feedback in that the musician has grown accustomed to muscular tension and imbalance. Many pedagogical sources focus on external body position, overlooking the value of utilising "the body's natural ability to organize itself and the psychophysical preparation before a movement takes place" (Carpinteyro-Lara 2014:2). Kleesattel (2012) studied the application of somatic disciplines to cello playing and pedagogy. The somatic methods explored were the AT, FM, Ideokinesis, Laban Movement Analysis and Bartenieff Fundamentals, all of which emphasise body-mind integrity. Kleesattel (2012:105) asserts:

> The ultimate goal is to achieve a technical proficiency and mental acuity that can effortlessly speak the soul of the performer. With complete awareness of the mind and body, a person can probe to deeper levels within themselves and to deeper levels with others, unhindered by their corporeal limitations.

An ethnographic study by Woodard (2009) outlined the teaching of movement to musicians, utilising BMg. She illustrates musicians' need for movement awareness and embodiment because of the complex demands of performance, and provides a methodology for music educators, underscored by an interdisciplinary theoretical framework drawn from neuroscience, anthropology, phenomenology and ethnomusicology. As demonstrated by her research, "training movement through the practice of body mapping enhances musical performance with fluidity and expressiveness" (Ibid. 2009:170).

Four research studies, which examined BMg instruction in different contexts, were identified (Wong 2015; Buchanan 2011; Grossman 2005; Knaub 1999). Wong's quantitative study (2015) evaluated the immediate effects on pianists' body usage and musical quality after a single 50-minute somatic session in either the AT (three participants), FM (three participants), or BMg (four participants). In total, there were 10 participants whose test sessions were audio- and video-recorded. There was no control group. The video and audio clips were each blind-reviewed by a viewing and listening panel; the former to assess body usage and the latter musical quality. In addition, the pre- and post-somatic clips were paired and sent to a different panel of

experts who were asked to identify the post-somatic clip from each randomly-ordered pair, utilising body usage or musical quality. The results show objectively measured and consistent improvement in almost all rating parameters. These were significant improvements in two parameters: head and neck, and tone. Overall, the findings demonstrated changes in both body usage and musical quality, although they were not always as easily identified as had been speculated. The study results suggest that the post-somatic session playing was more easily identified through body usage than musical quality. Although there were limitations, such as the fact that the AT and FM lessons were given in person, whilst the BMg lesson was delivered online, the small sample size, and only one measurement point, the study yielded valuable objectively verifiable data showing the benefits of somatic methods and paving the way for future quantitative research with longer interventions and more than one measurement point.

The mixed methods study by Grossman (2005) documented the effects of six 20-minute BMg lessons on the playing of 22 elementary string pupils between the ages of eight and 11. The lessons were taught to the class as a whole, and the qualitative and quantitative data were obtained through analysis and scoring of pre- and post-test videos, with observations quantified by a scoring rubric. The students' balance whilst sitting, ease of movement and tone quality were analysed, resulting in measurable, statistically significant improvements.

A qualitative study by Knaub (1999) explored student musicians' perceptions of their training in the AT, including BMg principles, which they applied in both musical and non-musical situations. The aim was to explore the ways in which male and female musicians' experiences differed. The data was taken from 500 journals and reports written over a period of 25 years. Five instrument categories were used, namely piano, upper strings, lower strings, woodwind and singers. The changes noted included less tension and pain, particularly in the back and arms, a calmer attitude in stressful environments, improved arm mobility and sound production, and improved body awareness. The study results attest to the benefits of the AT and BMg.

Buchanan (2011) investigated student musicians' perceptions of their performance and development after their participation in an elective one semester (15-week) BMg course at a university in the USA. The qualitative study was the first of its kind in the field of BMg in that it documented tertiary students' experiences of the influence of BMg instruction on their musical performance (Buchanan & Hays 2014:4). Data from the 12 second-, third- and fourth-year undergraduate students, whose performance areas were bassoon, conducting, euphonium, flute, organ, piano, violin and voice, were gathered primarily from in-depth interviews and self-reflective journals, together with course materials. Ten faculty members, mainly studio teachers, also gave feedback on the progress of their student/s. The action research methodology was guided by an interpretative framework (Ibid. 2014:6).

BMg positively impacted most students, a finding which was corroborated by their teachers' observations. The multifaceted benefits included improved musical performance skills and expression ability, such as dynamics, phrasing, emotional communication and expressive confidence. Examples of technical elements that developed were richer tone, enhanced breath support, clearer articulation and improved intonation. Increased ease of movement and an understanding of the association between movement and sound occurred among all participants. This was evident in the students' perceptions of improved understanding with regard to breathing, improved body coordination, enhanced flexibility, feeling centred, maintaining focus under pressure, enhanced artistic freedom and self-empowerment. The study showed that BMg facilitated an improvement in the students' self-awareness, movement perception, muscular tension, playing-related discomfort, and self-regulated learning and problem-solving skills. Of particular importance was the finding that "understanding anatomical information does not automatically equate with the securing of an accurate body map" as there was generally a discrepancy between the students' cognitive understanding of the BMg concepts and their application of the material in a practical sense, with the latter at a lower level (Buchanan 2011:314). Buchanan (2011:315) notes that master classes were beneficial in this regard as they assisted students to integrate the theoretical knowledge with the experiential physicality of performance. Also important was the fact that the students' level of

motivation, positive attitude, consistency of work, determination, realistic expectations, patience to allow change over time, and studio teacher support were factors associated with their degree of progress (Buchanan 2011:ii-iii). Her study showed how the application of BMg principles can be used to bring about improvements in both musical technique and performance, and verifies the significance of biomechanical movement instruction in musicians' training (Buchanan & Hays 2014:22).

3.3.11 Body Mapping in Tertiary Music Training

The literature review has shown that somatic components of musicians' occupational health courses are beneficial and that musculoskeletal education is recommended due to the high prevalence of pain and injury. Ackermann (2016:247) points out the lack of physiological and anatomical education for musicians. BMg may be appropriate to fill this gap as it is the only somatic education method focusing specifically on musicians, hence the suitability of its inclusion as the somatic component of a musicians' occupational health course. It is also adaptable to a range of musical settings, such as individual sessions, vocal and instrumental ensembles, large classes and lecture-style formats. BMg is valuable as it incorporates both the cognitive and physiological components of movement retraining (Buchanan & Hays 2014:5).

An important advantage of BMg is that it is a tool that can be integrated into other somatic approaches to help train and refine the kinaesthetic sense (Carpinteyro-Lara 2014:18). Krayer-Luke (2009:38) mentions several other perceived advantages that BMg has over other methods: students can easily grasp the material and, in turn, teach it to their students; BMg is taught without any hands-on contact which is ideal considering regulations for music educators in many countries which forbid teachers from touching students; teaching BMg in a group setting is practical and economical; and with the BMg approach, playing-integrated movement rehabilitation from injury is possible as students are taught BMg with their instrument.

BMg is incorporated into the music curriculum at several American universities, either as a course or a course component. Music educators who have qualified with Andover

Educators as BMg teachers also integrate the principles into their teaching (Buchanan 2011:93), for example the Coordinate Movement Programme at Portland State University, which integrates piano technique, BMg, musicianship and wellness (Bindel 2013:6). The John J. Cali School of Music at Montclair State University in New Jersey runs a musicians' health course which has BMg as its core somatic education component (Buchanan 2011) and the Healthy Musicianship elective at Michigan State University incorporates BMg (Palac 2015). Buchanan (2011:94) listed numerous universities in the USA and Canada where BMg was taught either as a course or course component, or included in practical studio and ensemble education.[36] The current spreadsheet of BMg university courses, compiled by Andover Educators and updated on 30 October 2017, includes several other universities in addition to those mentioned by Buchanan.[37]

Together, the studies presented and the number of universities where BMg is taught provide evidence of its value. While there is also a great deal of non-scholarly published literature on the BMg approach and its benefits for musicians, there is a clear lack of rigorous research data to prove these claims. Further study on the application of BMg principles and their effects on musical health and performance is necessary (Buchanan 2011:92).

[36] Anderson University, Anderson, South Carolina; Bradley University, Peoria, Illinois; Central Michigan University, Mount Pleasant, Michigan; Clayton State University, Moscow, Georgia; Denison University, Granville, Ohio; Memorial University, St. John's, Newfoundland, Canada; Michigan State University, East Lansing, Michigan; Montclair State University, Upper Montclair, New Jersey; Portland State University, Portland, Oregon; Susquehanna University, Selinsgrove, Pennsylvania; University of Nevada, Las Vegas, Nevada; University of North Carolina, Greensboro, North Carolina; University of Colorado, Boulder, Colorado; University of Northern Colorado, Greeley, Colorado; University of South Carolina, Columbia, South Carolina; Willamette University, Salem, Oregon.

[37] Oberlin Conservatory, Oberlin, Ohio; Columbus State University, Columbus, Georgia; New England Conservatory of Music, Boston, Massachusetts; University of Cincinnati College-Conservatory of Music; Longy School of Music of Bard College Cambridge, Massachusetts; University of Idaho, Moscow, Idaho; Wilfrid Laurier University, Waterloo, Canada.

3.4 CONCLUSION

Chapter 3 has provided an account of the research related to health promotion education for student musicians, and investigated the field of somatic practices and its relevance to musicians, with specific focus on the BMg method.

Tertiary musicians' health promotion and injury prevention education at tertiary level is imperative. Health education for musicians should be embedded in the curricula of music training programmes. The research on advocacy, health standards legislation for music schools in the USA, content of health education courses, collaborative programmes, impact assessments and examples of courses was reviewed. The literature on somatics was explored, particularly that on educative somatic approaches relevant to musicians. This led to a thorough investigation of the background and application of BMg, as well as the research within the field. Furthermore, the minimal SA research on musicians and somatic practices was surveyed.

The review presented provides evidence that further study on the content, implementation and effectiveness of musicians' occupational health programmes at tertiary level is necessary. This is particularly crucial in SA where there is no tertiary musicians' health education. Somatic education methods are shown to be appropriate ways of addressing the movement anatomy and body-related aspects of musicians' health coursework. BMg was specifically developed for musicians, yet only one prior study on its inclusion in the training of tertiary musicians exists, as it is a relatively 'young' somatic practice. BMg has the potential to be used in music education to improve performance, help prevent PRMD and enhance well-being in musicians. It is essential to consider the interdependence of musculoskeletal and psychological aspects in terms of musicians' health, and BMg is a holistic somatic approach which may therefore be a beneficial resource. Further research on the incorporation of BMg principles into tertiary musicians' education is necessary, specifically tertiary occupational health coursework with BMg as the somatic education component.

The present study is closely related to that of Buchanan (2011) but differs in that the course in the present study is a musicians' occupational health course with BMg forming the somatic education component as a core element thereof, while Buchanan's was a BMg course. The context differs in that the participants in the present study attend a SA university, and it is the first research study in SA on both BMg and tertiary musicians' occupational health coursework. Internationally, it is the first research on the incorporation of BMg in musicians' occupational health coursework. The present study is also qualitative and explores the students' lived experiences. However, there are differences with regard to the study design, data collection and analysis and, most importantly, the approach used, namely Interpretative Phenomenological Analysis (IPA). The exact methods and procedures are the subject of the next chapter.

CHAPTER 4
RESEARCH DESIGN

4.1 INTRODUCTION

This chapter presents an outline of the research procedure undertaken in this empirical study. The research design will be presented systematically, beginning with an overview of interpretivism and qualitative research, including some insights into their philosophical and theoretical foundations. I will explain phenomenology and Interpretative Phenomenological Analysis (IPA), and the reasons for this choice. An account of the sampling, recruitment and participants will be followed by descriptions of the methods of data collection, ethical considerations, the researcher's role, issues of validity and reliability, and the intervention, namely the Musicians' Occupational Health Course (MOHC). Finally, the data analysis strategy will be presented.

The research paradigm is the conceptual framework which "guides the researcher in philosophical assumptions about the research and in the selection of tools, instruments, participants, and methods used in the study" (Ponterotto 2005:128). An interpretative paradigm underpins this study and was chosen in order to accomplish the aim of the research, namely to explore student musicians' experiences of an occupational health course incorporating the Body Mapping approach. A qualitative descriptive design with a hermeneutic framework was therefore appropriate. Data was collected by means of semi-structured interviews, questionnaires and journals. Sampling was purposeful, and the phenomenological methodological approach, Interpretative Phenomenological Analysis (IPA), was employed for the thematic data analysis.

4.2 INTERPRETIVISM AND QUALITATIVE RESEARCH

Various paradigms, which guide a research study and the role of the researcher, and which provide frameworks and perspectives, such as Positivist, Post-positivist, Social Constructivist, Transformative, Postmodernist, Pragmatist, Interpretive, Critical and Multiparadigmatic, exist (Mertens 2015). Contrary to the positivist paradigm which underscores quantitative methods, the interpretivist paradigm is concerned with multiple interpretations of a single event rather than one objective reality (Mertens 2015:18; Guest, Namey & Mitchell 2012:6). The interpretivist ontology (assumptions of the nature of reality) assumes that multiple realities or perspectives exist which are socially constructed (Petty, Thomson & Stew 2012a:269). Reality is subjective and shaped by the individual's perceptions, the environment and interactions with the researcher (Ponterotto 2005:130). The epistemology (the theory of knowledge) is that knowledge is based on those numerous views, social constructs and meanings which must then be understood (Petty et al. 2012a:269; Ponterotto 2005:131). Therefore, the fundamental assumption of interpretivism is that "people seek understanding of the world in which they live" (Petty et al. 2012a:270). The focus is on interpreting, understanding and exploring the meaning of phenomena and experiences (Merriam 2009:5). As explained by Creswell (2013), the researcher intends to make sense of and interpret the participants' meanings and perceptions, which is the aim of this study. In this way, the perspectives of both the participant and the researcher are acknowledged and included (Grbich 2013:4).

As Ponterotto (2005:129) asserts, interpretivism "provides the primary foundation and anchor for qualitative research methods". Qualitative research therefore incorporates a range of approaches which are derived from an interpretive paradigm, such as ethnography, phenomenology, grounded theory, case study and narrative research (Petty, Thomson & Stew 2012b). However, Petty, Thomson and Stew (2012b:378-80) also refer to the nuances, developments and variants within certain approaches, for example case study or grounded theory variants which may be influenced by a more positivist epistemology or may follow an entirely interpretivist perspective. As Creswell (2013) notes, the list is always growing, with many interpretive approaches providing

their own very distinct theoretical lens, including feminism, racialised discourses, critical theory, post-colonialism and disability theory.

Smith, Flowers, and Larkin (2009:44) note that whereas quantitative research generally aims to explain what happens, qualitative research focuses on "how people make sense of what happens". A suitable topic is therefore often more personal, seeks to capture subjective experience and is concerned with how people express their understandings of their realities (Silverman & Marvasti 2008). In a qualitative study, generalisation and replication are not likely as each study is time- and context-bound (Grbich 2013:5). According to Mertens (2015:236), "qualitative methods are used in research that is designed to provide an in-depth description of a specific program, practice, or setting", hence the suitability of a qualitative method with a descriptive design for this study. Qualitative methods enable a deeper grasp of biopsychosocial phenomena (Biggerstaff & Thompson 2008) through developing an idiographic understanding of the participants in their specific social reality, and what a particular situation, condition or event means to them (Hesse-Biber & Leavy 2011; Merriam 2009). There is a great deal of complexity as the multiple and diverse meanings are developed through interaction with others in the particular environment (Merriam 2009). Findings typically demonstrate "detailed exploration of the interwoven aspects of the topics or processes studied (Yardley 2000:215).

Merriam (2009:14) summarises the major characteristics of qualitative research succinctly, stating that "the focus is on process, understanding and meaning; the researcher is the primary instrument of data collection and analysis; the process is inductive; and the product is richly descriptive". Whereas research designs in quantitative methods are structured and pre-determined, qualitative designs are emergent and flexible as they respond to the evolving study requirements (Merriam 2009:18). Research questions may progress and change as the study develops, due to the ontological assumptions, such as the multiple social constructions of reality, meaning and knowledge, and the ongoing interactions between investigator and participants, yielding varied perspectives (Mertens 2015:20).

Quantitative research, on the other hand, aims at measuring frequency, determining cause and effect, testing hypotheses, controlling variables and employing statistical analyses, resulting in findings that are precise and numerical (Petty, Thomson & Stew 2012; Merriam 2009; Ponterotto 2005). Objectivity, reliability, and internal and external validity are therefore hallmarks of quantitative research, whereas qualitative methods support subjectivity, and aim for trustworthiness and authenticity (Lincoln & Guba 2000:166). Subjectivity is an integral part of qualitative research in that the researcher's subjective role in the construction of knowledge is recognised and emphasised (Grbich 2013:4; Petty et al. 2012a:269).

The philosophical roots of qualitative research are, among others, in phenomenology, symbolic interactionism and constructivism, while quantitative approaches have positivism, logical empiricism and realism as their underlying philosophical traditions (Merriam 2009:18). These philosophical foundations of qualitative approaches are discussed in different ways by different authors, using a range of terminology, yet ultimately each author makes sense of his or her primary philosophical influences in his or her own way (Merriam 2009:8).

An important advantage of qualitative methods in health-related research is that practice and research are brought closer together (Yardley 2000:224). In psychological and educational research, a wide variety of qualitative research approaches exist, although important approaches are phenomenological, ethnographic, grounded theory, case study and participatory action research (Mertens 2015:242). Interpretative Phenomenological Analysis (IPA), the particular phenomenological approach to qualitative analysis chosen for this study, will now be discussed in more detail.

4.3 INTERPRETATIVE PHENOMENOLOGICAL ANALYSIS (IPA)

IPA is concerned with investigating how people make sense of an important experience in their lives (Smith, Flowers & Larkin 2009). It provides both a theoretical foundation and a detailed procedural format for phenomenological research and data

analysis, which is intended to be used flexibly (Brocki & Wearden 2006). Drawing on a range of phenomenological stances, it emphasises the interpretative aspects (Eatough & Smith 2008:182) and facilitates rigorous investigation of idiographic subjective experience (Biggerstaff & Thompson 2008). IPA's background is mostly in health psychology, although it is used widely in educational and social psychology, and is currently also applied in the human, health and social sciences (Smith et al. 2009:5; Murray & Holmes 2014:17).

Research questions in IPA studies focus on aspects of lived experience (Eatough & Smith 2008:187). The term 'lived experience' is used to depict "the embodied, socio-culturally and historically situated person who inhabits an intentionally interpreted and meaningfully lived world" (Eatough & Smith 2008:181). IPA is therefore frequently utilised to understand how people make sense of a particular life event, process or phenomenon (Smith, Flowers & Larkin 2009; Eatough & Smith 2008). IPA is particularly concerned with uncovering individual subjective experience rather than conveying objective accounts (Eatough & Smith 2008:181; Brocki & Wearden 2006). With its inductive approach, IPA analysis begins with specific observations and gradually moves towards more general conclusions. Prior assumptions are avoided and hypotheses are not tested (Reid, Flowers & Larkin 2005:20). Through its explicit interpretative methodology, IPA acknowledges the fundamental role of the analyst in understanding and interpreting the participants' experiences (Pringle, Drummond, McLafferty & Hendry 2011:20; Biggerstaff & Thompson 2008). Brocki and Wearden (2006) remind the reader that IPA also allows for the interpretive factor even at the stage of data generation by the researcher. Importantly, IPA recognises that the researcher's interpretations of the data are constrained by the participants' ability to express themselves and articulate their thoughts, feelings and experiences (Brocki & Wearden 2006). Yet Larkin and Thompson (2012:114) outline six ways in which IPA studies may provide valuable insights:

- Understand the experiences of particular groups of people.
- Develop and evaluate services, therapeutic interventions, and so on [sic].
- Interpret the associative findings from conventional quantitative research.
- Situate and understand people in their socio-cultural contexts.

- Evaluate and reflect upon the role played by therapeutic, institutional and legislative cultures.
- Re-evaluate existing theory.

Reid, Flowers and Larkin (2005) note IPA's growth and diverse applications, such as in music, art and occupational therapy, being especially suited to biopsychosocial research in new areas where predefined hypotheses and theories do not exist and meaningful perspectives are needed. Clarke (2009:37) proposes IPA as a methodology appropriate for research to provide deeper insights into occupational health and well-being.

IPA was therefore a suitable choice for this study as it is an appropriate qualitative method for exploring participants' experiences of an intervention in an interdisciplinary health and educational setting. The phenomenon being examined was the musicians' occupational health course (MOHC), which was a significant experience for the participants as it was the first of its kind in the local context. I was interested in their perspectives, understandings and perceptions, and how they would make sense of the course. I hoped to be able to gain an in-depth understanding of what the MOHC was like for the students. The biopsychosocial approach of the course content (including neuromusculoskeletal health, psychological health, hearing conservation, vocal health, risk factors, prevention, practice methods, lifestyle and musicianship), required a qualitative approach which was suitable for exploring nuanced experiences, attitudes and understandings of health, well-being and artistry. Specifically incorporating BMg as the somatic focus required a research approach that would elucidate participants' understandings and perceptions of somatic education.

4.3.1 Phenomenology

The theoretical foundations of IPA lie in three key areas of philosophy: phenomenology, hermeneutics and idiography, which inform its epistemological framework (Shinebourne 2011:17; Smith et al. 2009:11; Eatough & Smith 2008:179). Although phenomenology is a philosophical orientation that influences all qualitative research, it is also a particular type of qualitative approach that uses specific

phenomenological tools (Merriam 2009:27). A fair amount of qualitative research is phenomenological in that it tries to understand lived experience and its behavioural, emotive and social meanings (Guest, Namey & Mitchell 2012).

Phenomenologists are interested in what experiences of living are like for people and how researchers can comprehend that lived experience (Shinebourne 2011:17) based on the principle that "the reality that we live is an experiential one and it is experienced through practical engagements with things and others in the world, and it is inherently meaningful" (Eatough & Smith 2008:180). Suitable for this research, phenomenological approaches aim to describe and understand an event from the participant's perspective because individual subjective experience is prioritised (Mertens 2015:247). Although none of the phenomenological philosophers developed research methods, phenomenology draws on their rich philosophical foundation (Creswell 2013). Significant figures in phenomenology were Husserl, Heidegger, Merleau-Ponty, Sartre and Van Manen.

Husserl's phenomenology involved going back to the very experience itself and attempting to define the essential qualities, thus examining the experiential content of consciousness (Smith et al. 2009:13). A reflective dimension and intentionality allow an intentional conscious reflection of the previously taken-for-granted experiencing, 'bracketing' or putting aside the latter. Further 'reduction' enables seeking the 'essence' of a phenomenon, the core of subjective experience (Smith et al. 2009:14). Smith et al. (2009:16) note that Husserl can be seen "as primarily concerned with what can be broadly classified as individual psychological processes, such as perception, awareness and consciousness".

In contrast, Heidegger's notion of 'Dasein' ('being-there') was concerned with a uniquely situated 'person-in-context', necessitating an intrinsic relatedness to the world (Smith et al. 2009:17). The material world, relationships, language and subjectivity are all part of that contextualised phenomenology; thus, the perspectival and interpretative qualities become important (Smith et al. 2009:18). Heidegger emphasised the interpretative (hermeneutic) aspect of phenomenology, viewing it as

a prerequisite to phenomenology (Shinebourne 2011:19). He also clarified the notion of ‘bracketing’ in the sense that it is only partially attainable and is a continuous, reflexive and cyclical process (Smith et al. 2009:25).

Merleau-Ponty further developed phenomenology with his focus on the body as an integral part of each subjective lived and experienced reality (Eatough & Smith 2008:180). He emphasised the embodied aspect of relatedness to the world, yet echoed Husserl’s views concerning the undeniable subjectivity of the so-called objectivity of science, which is always dependant on subjective personal perspectives and experiences (Smith et al. 2009: 18). Merleau-Ponty (in Smith et al. 2009:18) explains that “the body is no longer conceived as an object in the world, but as our means of communication with it”. This notion of embodiment emphasises the unique individuality of ‘body-in-the-world’ experience, with physical and sensory aspects reducing the significance of cognitive factors (Smith et al. 2009:19). For Sartre, the ongoing dynamic process of being was central, as was its continuous development through relationships and activities, “and the embodied, interpersonal, affective and moral nature of those encounters” (Smith et al. 2009:21). Van Manen was interested in the hermeneutic phenomenological approach, an individual’s purposeful focus on creating meaning and an interpretative reflective ability within a holistic life experience (Eatough & Smith 2008:181).

By drawing on the contributions of all these phenomenologists, IPA seeks to examine the subjective experience of a specific significant phenomenon (Smith et al. 2009:33). According to Smith et al. (2009:21), “…the complex understanding of ‘experience’ invokes a lived process, an unfurling of perspectives and meanings, which are unique to the person’s embodied and situated relationship to the world”. Influenced by phenomenology’s core principles, IPA contends that human lived experience can be understood “via an examination of the meanings which people impress upon it” (Smith et al. 2009:34).

4.3.2 Hermeneutics

IPA is also informed by hermeneutics: the theory of interpretation or sense-making. Interpretative or hermeneutic phenomenology, simultaneously a methodology and a philosophy, aims to move away from any kind of mind-body dualistic thinking and situate people with perceptions, experiences and social interactions in their environments, moving towards a mind-body-world synthesis. This takes into account Merleau-Ponty's phenomenology of "the situated, social and sentient body" (Given 2008:461-2). IPA is both phenomenological and hermeneutic. The former discovers meaning and the latter interprets that meaning. According to Smith et al. 2009:37), "it is phenomenological in attempting to get as close as possible to the personal experience of the participant but recognizes that this inevitably becomes an interpretative endeavour for both participant and researcher". The participant interprets and makes sense of the experience, tells the researcher about it, and the researcher interprets the participant's account. This can be seen as a double interpretation process (Pringle et al. 2011:20; Smith et al. 2009:35). In addition, the IPA researcher positions herself on two hermeneutic levels, merging a 'hermeneutics of empathy' with a 'hermeneutics of questioning'. In the former, the researcher seeks to explore the phenomenon from the perspective of the participant, whereas in the latter, the researcher pursues independent interpretative work (Shinebourne 2011:22; Clarke 2009:38; Smith et al. 2009:36). Larkin and Thompson (2012:101) refer to these two elements as 'giving voice' to the participants and 'making sense' of their accounts through interpretation. IPA recognises that the analyst cannot escape interpretation, but that continuous self-reflection is necessary during the interpretations, which must stay grounded in the participants' accounts (Larkin & Thompson 2012:103).

4.3.3 Idiography

Idiography as the third theoretical tenet informing IPA is concerned with "an in-depth focus on the particular and commitment to a detailed finely-textured analysis" (Shinebourne 2011:22). The meaning and significance of a particular experience for the individual participant, from their perspective and in a specific context is central to

IPA with its idiographic analytic focus (Larkin & Thompson 2012:102; Smith et al. 2009:29). IPA therefore draws on single case studies or a small group of cases in which the analysis starts specifically on each case, and moves on to discovering dominant and divergent trends, and capturing the emerging patterns across the group (Shinebourne 2011:23; Smith et al. 2009:3; Eatough & Smith 2008:183). With its idiographic emphasis, the aim of an IPA study is not to produce large volumes of information, but to gather quality information in order to uncover a deeper understanding (Clarke 2009:38). IPA therefore has small and homogenous groups of participants sharing a particular experience. An average recommended maximum sample size is 10 participants (Reid et al. 2005:22). A suitable number of participants, however, depends on the aims and context of the study (Larkin & Thompson 2012:104). According to Smith (2009:51), “the issue is quality, not quantity” and IPA research benefits from a more concentrated focus on fewer cases. Therefore, studying several participants’ reactions to their experience in a musicians’ health course is a natural fit for IPA.

4.3.4 Sampling

Sampling strategies can be broadly categorised as using either probability or non-probability techniques. In random or probability sampling, each member of the defined population has a known and equal chance of being included (Mertens 2015:328). Non-probability sampling is most common in qualitative research due to the requirements of gleaning detailed in-depth data from a small number of participants. Examples of non-probability sampling are convenience sampling, quota sampling, snowball sampling and purposive sampling (Given 2008). Purposive sampling can be further categorised as extreme or deviant cases, intensity sampling, maximum-variation sampling, homogenous sampling, typical-case sampling, critical-case sampling and purposive random sampling (Mertens 2015; Cresswell 2013).

The 19 MOHC course attendees were selected by way of convenience sampling. Convenience sampling describes a situation where the participants are readily

accessible (Mertens 2015:335). In my research, any full-time registered student in the music department could answer my call and volunteer.

The smaller IPA sample of 12 study participants was selected by means of homogenous, purposive sampling from the convenience sample of 19 course attendees. In purposive sampling, individuals are identified by the researcher and chosen strategically and intentionally based on their ability to offer the depth of information required (Mertens 2015; Creswell 2013). Mertens (2015:331) explains how purposive sampling allows researchers to select participants "with the goal of identifying information-rich cases that will allow them to study a case in depth". Similarly, Smith et al. (2009:48) describe how purposive sampling enables the researcher to gain insight into a particular phenomenon so that the participants "represent a perspective, rather than a population".

4.3.5 Recruitment

In order to inform the student body and invite participants for the study, I made MOHC information flyers available at student registration from 10 to 12 February 2014. During the following week, when the first semester started, I placed the MOHC information posters[38] on noticeboards around the music department and sent out the same notice on the online electronic communication portal that goes to all registered music students. I also put the information flyer in all lecturers' pigeonholes at reception and emailed them to ask whether I could visit their studio classes to hand out my flyers and briefly explain the MOHC to their students. Some responded, whom I visited: two vocal lecturers' studio classes, the African music department, two piano lecturers' studio classes, the general brass studio class and the general woodwind studio class.

[38] See Addendum B: The information poster/flyer advertising the MOHC.

During March and early April, students who expressed interest were emailed and physically given the prospective students' information form[39]. This form included fields for name, student number, age, gender, course, academic year, voice/instrument, email address, cell number, journal-writing, motivation and information regarding being interviewed, completing questionnaires and any existing performance-related health problems. By May 2014, I had a preliminary class list of 24 students who had signed up. Finding a venue at the music department and time for the class proved to be challenging. Due to the demand for lecture venues, the MOHC could not take place during peak lecture times as it was an extra non-credit class. There were many variables to consider, including all 24 students' timetables and the availability of venues. In early June, the most suitable time-slot and venue was Wednesdays at 17h00 in Room S4. Most of the students were available at this time, although five were unable to attend due to scheduling conflicts, resulting in a total class number of 19 students. These students were emailed informed consent forms[40] in late June, all of which were returned either as hard or electronic copies by the middle of July 2014. The second semester started on Monday 21 July 2014 and the first MOHC lecture was held on Wednesday 23 July 2014.

4.3.6 The Participants

The IPA study sample of 12 students, which was drawn from the class of 19 course attendees, was as homogenous as possible, with selection criteria allowing for a balanced group in terms of gender, age, instrument or voice, educational level and musical genre. There were no specific exclusion or inclusion criteria. (Please see Table 4-1 for a summary of their information.)

Bongi was a 20-year-old violinist (Western art music) in the first year of her Bachelor of Music (BMus) degree in Performance. Dorothy, aged 23, was in the fourth and final

[39] See Addendum C: The prospective student's information form.
[40] See Addendum D: The informed consent form.

year of her BMus (Performance) degree, on the piano (Western art music). Frank, aged 23 and a postgraduate clarinettist, was doing his BMus Honours in Performance (Western art music). Gabrielle, aged 19, was a soprano in the first year of her BMus (Performance) degree majoring in voice (Western art music). Malika was a 19-year-old soprano in the first year of the BMus (General) degree. Mandla, a jazz electric bass player, aged 21, was in the third year of his BMus (Performance) degree. Max, aged 24, was in the first year of his Performer's Diploma in Music and was a jazz double bassist. Jolene was a 21-year-old violinist (Western art music) in the second year of her BMus (Musicology) degree, with a focus on Ethnomusicology. Jayden, a Western art music violinist, aged 21, was in the third year of his BMus (Performance) degree. Khanyi was a 21-year-old jazz saxophonist in the fourth and final year of her BMus (Performance) degree. Willem, age 24, was doing the Postgraduate Diploma in Music Performance (African Music), playing several African percussion instruments, often with singing included. Wendy, a Western art music oboist, was in the fourth and final year of her BMus (Performance) degree.

Table 4-1: IPA participants' information[41]

PARTICIPANT	AGE	SEX	YEAR LEVEL	MUSICAL GENRE	INSTRUMENT OR VOICE	MAJOR	ETHNICITY	ATTENDANCE
Bongi	20	F	1	Western art music	violin	General	White	92% 12 lectures
Dorothy	23	F	4	Western art music	piano	Performance	White	100% 13 lectures
Frank	23	M	5	Western art music	clarinet	Performance	White	100% 13 lectures
Gabrielle	19	F	1	Western art music	voice	General	Black	77% 10 lectures
Malika	19	F	1	Western art music	voice	General	White	62% 8 lectures
Mandla	21	M	3	Jazz	bass guitar	Performance	White	85% 11 lectures

[41] Pseudonyms have been used to protect the identity of the participants.

PARTICIPANT	AGE	SEX	YEAR LEVEL	MUSICAL GENRE	INSTRUMENT OR VOICE	MAJOR	ETHNICITY	ATTENDANCE
Max	24	M	1	Jazz	double bass	Performance	Black	92% 12 lectures
Jolene	21	F	2	Western art music	violin	Ethnomusicology	Black	92% 12 lectures
Jayden	21	M	3	Western art music	violin	Performance	Asian	92% 12 lectures
Khanyi	21	F	4	Jazz	saxophone	Performance	White	85% 11 lectures
Willem	24	M	5	African music	African percussion	Performance	White	77% 10 lectures
Wendy	22	F	4	Western art music	oboe	Performance	White	85% 11 lectures

Among the seven female and five male students, the average age was 21 and a half. The age of the youngest participant was 19, and the oldest 24. Three students were jazz majors (saxophone, double bass and bass guitar), one African music major (diverse African instruments), one ethnomusicology major, and seven Western art music majors (voice, piano, violin, oboe and clarinet). There were two postgraduate students, three fourth-year students, two third-year students, one second-year student, and four first-year students. Regarding levels of competency on their instrument or voice, eight of the students were performance majors with very advanced skills. The other four had average to above-average proficiency and were doing music degrees which were not focused on performance, namely the general music degree stream or musicology. Regarding race/ethnicity, eight participants were white, three were black, and one was Asian.

4.4 DATA COLLECTION

The emphasis in qualitative research on subjective meaning in context requires a data collection method that is sensitive to the underlying meaning. Common methods of data collection therefore include interviews, conversations, observations, field notes, photographs and recordings; situated activities “that locate the observer in the world” (Mertens 2015:236). The following section will outline the data collection procedures in this study, including the interviews, questionnaires and students’ journals. Ethical considerations and the researcher’s role will also be discussed.

4.4.1 Interviews

According to Merriam (2009:88), interviewing is frequently used in qualitative studies and enables the acquisition of information from the participant’s perspective. She further explains that interviews may be structured, semi-structured or unstructured. The wording and order are fixed in a structured interview, which is then like an oral delivery of a survey, and usually used to gather demographic data. The semi-structured interview consists of a flexibly-used guideline of questions without a fixed order or wording, but with specific issues to be explored. The unstructured interview

is exploratory, without any specific framework, and is more like a conversation (Merriam 2009:89).

Most commonly, data collection in IPA is done through semi-structured interviews as these allow for flexibility and facilitate the emergence of the participant's voice and perspective (Smith et al. 2009:4), allowing for "the giving and making of an account in a sensitive and empathic manner" (Eatough & Smith 2008:188). This 'flexible collaboration' between interviewer and respondent facilitates in-depth and personal discussion, acknowledging that interviewing is not a 'neutral' data collection method (Reid et al 2005:22). Larkin and Thompson (2012:104) are of the opinion that "an IPA interview is not about collecting facts, it is about exploring meanings".

Questions in the interview schedule should be open-ended and aimed at gleaning descriptive data, focusing on aspects, such as experience, behaviour, opinions, values, feelings, sensory aspects, knowledge and demographics as needed (Merriam 2009:100). Probes, prompts or follow-up questions generate expansion on responses to gather more in-depth detail and yield information not expected by the researcher, thus allowing the researcher to hear the subject's own words (Guest, Namey & Mitchell 2012). The questions prepared by the researcher are used only as a guide to the dynamic interview, allowing participants to reveal unanticipated information and challenge the researcher's prior assumptions (Eatough & Smith 2008:188). Smith et al. (2009:58) note that unprompted, unexpected content may also reveal something of particular importance to the interviewee. Eatough and Smith (2008:189) assert that "learning to be able to move away from the script to follow the participant as he/she moves deeper into their personal experience is something that, while difficult, is at the heart of doing IPA well".

In IPA, participants are seen as the "experts on their own experiences and can offer researchers an understanding of their thoughts, commitments, and feelings through telling their own stories, in their own words, and in as much detail as possible" (Reid, Flowers & Larkin 2005:20). Smith (2009:68) describes how the interview "moves from the descriptive to the affective, from the general to the specific, from the superficial to

the disclosing". Questions should be open, descriptive, narrative, comparative, circular and contrasting rather than closed, manipulative, leading and over-empathic (Smith et al. 2009:50).

Pre- and post-course interviews were conducted, using the interview guide,[42] which included the main questions as well as the probes. The guide was constructed to enable a comfortable and trusting rapport with the participant, with initial questions intended to elicit more descriptive accounts, followed by questions leading to more analytical and evaluative responses as suggested by Smith et al. (2009:59). A pilot interview was conducted on 15 July 2014 with a fourth-year student who had hoped to attend the course but was unable to as she would be leaving soon for graduate study abroad. The pilot interview was a necessary pre-testing of the interview questions. Feedback enabled further refinement of the interview schedule, and gave me a valuable opportunity to practise and assess my interviewing skills.

There were 10 main questions in the pre-course interview guide, and 15 in the post-course interview guide. Questions that were the same for both the pre- and post-course interviews explored experiences, understandings and perceptions of awareness during playing or singing; physical comfort and/or discomfort; psychological aspects of performance; technical and performance proficiency; and artistry, expression and embodiment. The pre-course interview also comprised introductory questions on musical background and the meaning of music, as well as questions about motivation for the course, course expectations and awareness of musicians' occupational health, such as preventative strategies and optimising performance. Specific questions that were used only for the post-course interview related to course impressions, enjoyable and less enjoyable course components, beneficial and non-beneficial course content, challenges during the course and perceptions of Body Mapping.

[42] See Addendum E: The Interview Guide

Interviews took place without interruptions in a quiet, private office space that was familiar to the participants, who were also fully informed of the approximate length and style of the interview but had not been given the questions beforehand. As advised by Smith et al. (2009:63), I explained to the interviewees that there were no right or wrong answers, that they could take their time, and that my aim was to hear what they had to say about their experiences from their perspective.

It is also necessary to 'bracket' one's pre-existing viewpoints to be fully present to the participant's account (Smith et al. 2009:64). I endeavoured to do so to the best of my ability, using the interview guide flexibly, incorporating prompts, being an attentive and active listener, and following the interviewee's concerns so that "in some instances it may be that the interview moves completely away from the schedule and instead follows a course set by the participant" (Smith et al. 2009:65). The challenges that I faced, some of which are mentioned by Smith et al. (2009:67), were staying focused without being intrusive, remembering questions that needed to be returned to, being fully present in my listening without being over-empathic, and avoiding accidentally leading the participant through a moment of eagerness. Smith et al. (2009:67) caution the interviewer-researcher against being either therapeutic in their role or exerting academic authority. In some cases, during this study, the interviewee expressed strong emotion, such as distress, anger or grief during the interview. The unexpected role conflict which I experienced is clarified by Biggerstaff and Thompson (2008). I was simultaneously a researcher, gathering information, and a compassionate person experienced in education and mentorship. The interviewer-researcher, however, does not become a counsellor or psychotherapist, but is an empathic listener, who supports the interviewee, carries the interview forward and maintains ethical boundaries (Biggerstaff & Thompson 2008).

The 12 pre-course interviews were held from 21 to 28 July, each of which was given a one-hour slot. The average length of each interview was 40 minutes, ranging in length from 25 to 60 minutes. The 12 post-course interviews were conducted from 5 to 12 November. The average length of each post-course interview was 37 minutes, ranging in duration from 26 to 46 minutes.

The interviews were all recorded on my Zoom H4 audio recorder. A research assistant[43] was present at the interviews to do the recording so that I could focus on the interview. Prior to the interview, each participant was given time to ask any questions about the study, the interview questions, format and style, the consent forms, and the ethical considerations. It was interesting that each participant interpreted the interview questions differently, yielding a wide variety of responses, with the result that each interview followed a different and distinctive course.

The same procedure was followed for the transcription, participant validation, and data analysis of the pre- and post-course interviews. Two research assistants[44] did the first transcription of the interviews, after which I checked the transcripts meticulously, whilst listening to the audio recording. This involved several cycles of listening, re-checking and editing until I was satisfied with the accuracy of the transcriptions. I then emailed the transcripts to the interviewees for verification and approval, and asked whether any text needed to be removed. No changes, however, were necessary. Once the participant validation had been completed for each transcript, I started the interview analysis, using the computer-aided qualitative data analysis software (CAQDAS) programme, ATLAS.ti.

4.4.2 Questionnaires

The following four pre-course questionnaires were completed by all 19 class members: Background Information Questionnaire[45]; Epidemiological Questionnaire for Music Students,[46] Physical Symptoms Profile[47], and DASS42 (psychological symptoms).[48] At the end of the course, all of the class attendees completed three post-course

[43] The research assistant had signed a non-disclosure agreement.
[44] The research assistants had signed a non-disclosure agreement.
[45] See Addendum F: Background Information Questionnaire
[46] See Addendum G: Epidemiological Questionnaire for Music Students
[47] See Addendum H: Physical Symptoms Profile
[48] See Addendum I: DASS42

questionnaires: the music department standard course evaluation form[49], the Physical Symptoms Profile, and the DASS42 (psychological symptoms). There was also a post-course questionnaire for the instrumental or vocal teacher of each of the 12 IPA participants.[50]

The data from the pre-course Epidemiological Questionnaire for Music Students[51], the pre- and post-course Physical Symptoms Profile[52], and the pre- and post-course DASS42 were collected purely as supplementary information for the purposes of later research on university music students participating in health promotion and injury prevention courses. Any data that fell outside of the scope, aims and methodological approach of this study were not considered, and will not be included. I did not use any of the information gathered from these 'extra' questionnaires, and it did not influence my opinions or cloud my judgement at any time or in any way.

The following three questionnaires provided valuable supporting descriptive data for the IPA analysis of the interviews:

4.4.2.1 Pre-course: Background Information Questionnaire

The pre-course Background Information Questionnaire[53] had eight descriptive questions and yielded information that was used for the purposes of designing course content, determining specific participant needs and providing contextual information.

4.4.2.2 Post-course: The music department standard course evaluation form

The post-course music department standard course evaluation form is an anonymous form consisting of six statements, each of which is followed by a five-point Likert scale.

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[49] See Addendum J: Music department standard course evaluation form
[50] See Addendum K: Post-course questionnaire for the instrumental or vocal teacher
[51] See Addendum G: Epidemiological Questionnaire for Music Students
[52] See Addendum H: Physical Symptoms Profile
[53] Adapted from Buchanan (2011) with permission.

It included two questions requiring descriptive answers: ‘Which aspects of the course did you find the most valuable?’ and ‘Are there any other comments you would like to make?”

4.4.2.3 Post-course: Questionnaire for the teachers

The post-course questionnaire for the instrumental or vocal teacher of each of the 12 IPA participants had 13 *yes/no* questions and sections for optional descriptive comments. The purpose was to glean information on the teachers’ observations of their students during and after their MOHC attendance.

4.4.3 Students’ Journals

The journal assignment[54] was designed to assist students in developing their somatic awareness and integrating concepts related to body awareness, movement and posture during playing or singing. The emphasis was on students’ understanding of what they had learned, how they could apply it, and tracking their experiences, proprioceptive changes and self-observation skills. Although a format had been given as a guideline, students were free to write the paragraph in their own style. To provide some clarity and structure, the standard scientific method, comprising an observation, theory, hypothesis, experiment and a result, was explained. The acronym ‘FEEL’ was used to assist students with the process:

- F – Feel: What you observe / are aware of (sensory/physical awareness)
- E – Evaluate: Explain what you think could be happening
- E – Experiment: Possible solution / try something to improve / adjust
- L – Learn: What you have learnt / observe / feel the result / possible changes

[54] See Addendum L: The journal assignment

Students were asked to submit a short paragraph on a selected topic/concept that had been taught during the weekly lecture. The goal was for each student to submit one paragraph every week, with the first submission at Lecture 4, and the last at Lecture 13. This would result in 10 journal entries from each student.

The response, however, was very poor despite constant reminders and explanations. The average total submission per student in the IPA study sample of 12 students was two journal entries each. One student submitted five entries, one submitted four, three submitted three, four submitted two, one submitted one, and two submitted none.

These journals were intended as additional descriptive data to supplement the IPA analysis of the semi-structured interview data. However, the negligible yield, brevity and inconsistency of journal submissions meant that they could not be used. This will be discussed further in both the results and limitations sections.

4.4.4 Ethical Considerations

Numerous unavoidable ethical factors are encountered in the process of qualitative interview research due to the analysis of what people do and say, and the publication of interpretations (Brinkmann & Kvale 2008:263). Essential aspects that need to be considered are informed consent, confidentiality, consequences and the role of the researcher (Brinkmann & Kvale 2008:265). The avoidance of harm is an essential principle and the researcher must be cognisant of the impact that talking about sensitive topics may have on the participants (Smith et al. 2009:53). Mertens (2015:13) highlights three key ethical principles: beneficence, respect and justice. In addition, she discusses criteria, such as trustworthiness, authenticity, balance, fairness, reflexivity, rapport, reciprocity and caring, while acknowledging the emergence of possible ethical tensions (Mertens 2015:18).

Confidentiality and anonymity are descriptors that are frequently confused and sometimes cause unexpected complications due to their complexity. A clear explanation is provided by Mertens (2015:353):

> Confidentiality means that the privacy of individuals will be protected in that the data they provide will be handled and reported in such a way that the data cannot be associated with the research participants personally. Anonymity means that no uniquely identifying information is attached to the data.

Ethical clearance was obtained from the Ethics Committee of the UFS Faculty of Humanities (UFS-HUM-2013-31)[55] and the UCT Humanities Faculty Research Ethics Committee (HUMREC201406-01)[56]. Informed consent was obtained from the participants, who were informed of the study's aims, procedure, confidentiality, possible risks, benefits, voluntary participation, the right to withdraw and access to appropriate therapeutic support. Confidentiality and anonymity were ensured in that private identifying data regarding the participants were not reported and pseudonyms were used. The two research assistants who did the interview recording and the initial transcription were briefed on confidentiality after which they read and signed the non-disclosure agreement. Raw data transcripts were only seen by the research team (researcher, supervisor, co-supervisor and two research assistants) after which they were edited for anonymity though the use of pseudonyms and removal of identifying information. I was aware that the small sample size may make it possible for certain potential readers to identify, from the thesis, who some of the findings refer to. I was sensitive to this issue and handled the data with the utmost care, confidentiality and respect.

4.4.5 Researcher's Role

The researcher's observations, perceptions and reflections also form part of the data collection. These will be presented in the results chapter together with the IPA analysis.

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[55] See Addendum M: Ethical clearance letter UFS
[56] See Addendum N: Ethical clearance letter UCT

The role, bias, perspectives and assumptions of the qualitative researcher are acknowledged (Mertens 2015:17). According to Brinkmann and Kvale (2008:268), the moral integrity of the researcher in qualitative research is crucial. Maintaining the balance between professional distance and being interactive and creating a rapport adds to the ethical challenges with regard to the researcher's role (Brinkmann & Kvale 2008:268). I was aware of keeping my distance in my role as teacher, interviewer and researcher, whilst retaining the familiarity and empathy necessary to engage authentically and be fully present in each situation. This dynamic tension between subjectivity and perceived objectivity led me to develop a critical consciousness with regard to my underlying beliefs, views and assumptions, and to 'bracket' these where appropriate. The notion of 'bracketing' and the acknowledgement and value of the researcher's integral interpretive role are discussed in depth in the section on IPA.

4.5 THE MUSICIANS' OCCUPATIONAL HEALTH COURSE

The Musicians' Occupational Health Course (MOHC) took place in the second semester (mid-July until mid-November) of 2014.The study site was a tertiary music institution at a South African university. The 19 course attendees, from whom a smaller IPA study sample of 12 participants was selected, were full-time registered undergraduate and graduate music students at the music department, who volunteered to attend a semester-long musicians' occupational health course.

4.5.1 Course Overview

The MOHC ran for the whole 13-week semester, starting on 23 July and ending on 29 October. A summary of the course content and schedule is illustrated in Table 4-2, and a detailed description of the course will be presented in the next section. The class took place once a week for 90 minutes (every Wednesday from 17h15 to 18h45). There were 19 students, who had signed up for the course. Each class was filmed as a backup resource for me to check when writing in my observations journal and when immersing myself in the data analysis. This video recording was made with the

consent of the participating students and the utmost care was taken while handling this data resource to ensure the necessary confidentiality and privacy. The average course attendance percentage of all 12 IPA participants was 86.6% or 11 lectures. Regarding the attendance data[57] of the 19 students comprising the total class, the average course attendance percentage was 75.6% of the course or 10 lectures.

Table 4-2: The Musicians' Occupational Health Couse

LECTURE	DATE	CONTENT
1	23 July	Questionnaires, introduction and participants' individual performances
2	30 July	Common injuries: risk factors and prevention
3	6 August	Movement, the senses and awareness; somatic approaches
4	13 August	The core of the body and the places of balance
5	20 August	The movements and structures of breathing
6	27 August	Whole-body support for free arm movement; the legs as dynamic support.
7	10 September	Alexander Technique Workshop: Ingrid Weideman
8	17 September	Understanding performance anxiety. performance confidence tools
9	1 October	Practising: healthy, efficient and productive approaches to practising
10	8 October	Practical applications / master class with instruments / voice
11	15 October	Practical applications / master class with instruments / voice
12	22 October	Hearing issues: noise-induced hearing loss and hearing protection
13	29 October	Participants' individual performances, questionnaires and closure
* Class time: 17:15-18:45 * Venue: Room S4 or room C18 * No lectures on 3 September (university vacation week) and 24 September (public holiday)		

[57] See Addendum O: Course attendance register

4.5.2 Course Description

The course content was chosen following my extensive investigation into musicians' occupational health and preventative health education for musicians as evidenced in Chapters 2 and 3, with section 3.2.2 (content of tertiary musicians' health education) being particularly relevant. Fundamental health promotion categories that were identified included neuromusculoskeletal health, vocal health, hearing conservation and psychological health. The research demonstrated that a biopsychosocial approach was necessary, and supported the inclusion of physical, psychological and behavioural topics in preventative education, such as PRMD risk factors, postural training, anatomy, ergonomics, effective body use, breathing, performance psychology, efficient practice habits, hearing conservation and lifestyle.

Somatic (body-related) education methods have been shown in the literature to be suitable ways of addressing the movement anatomy and body-related areas of musicians' health coursework. The somatic aspects were taught from my perspective as an Andover Educator, qualified to teach Body Mapping (BMg) for musicians[58]. The six-module BMg course, 'What Every Musician Needs to Know about the Body'[59] was used as a guiding syllabus for the somatic component. The breakdown of the teaching aims, theoretical content and experiential learning applications for each lecture will be presented below.

[58] See Addendum P: Andover Educator Licensure Certificate 2010 – Bridget Rennie-Salonen
[59] See Chapter 3, section 3.3.9, Table 3-2: 'What Every Musician Needs to Know About the Body'

4.5.2.1 Lecture 1

At the first lecture on the 23 July, a class of 18 students was present (one student was absent). All 12 IPA participants were present. The questionnaires[60] were completed, after which I introduced the course and the students introduced themselves to one another.

There were no specific teaching aims for Lecture One as the class time was utilised for the completion of questionnaires, a very brief course introduction and students' performances. The IPA sample of 12 students had been informed that they would each be required to perform a musical item of their own choice, alone or accompanied, for approximately four minutes at the first and last lectures. This was for my own reference and for the students to be able to refer back to these experiences later in the course and, perhaps, to facilitate comparisons after performing in the final class. Only 10 of the students performed. I had wanted all 12 from the IPA sample to perform, but two were unable to do so that day as one students's accompanist could not be there and the other had needed to send her instrument in for a service. Details of the students' performances were as follows: Bongi (violin): Gigue from Partita No. 2 for solo violin by Bach; Dorothy (piano): Etude Op. 25 No. 9 by Chopin; Frank (clarinet): excerpt from Sonata by Brahms; Gabrielle (soprano): 'Bella Porta di Rubini' by Falconieri and 'Under the Greenwood Tree' by Quilter; Jayden (violin): Cadenza from Tzigane by Ravel; Jolene (violin): 1st movement from Partita No. 2 for solo violin by Bach; Khanyi (jazz saxophone): 'Things are Getting Better' by Cannonball Adderley; Max (jazz string bass): improvised 'Super-medley'; Malika (soprano): 'Se tu m'ami' by Pergolesi; Mandla (jazz electric bass): 'Up Jumped Spring' by Freddie Hubbard; Wendy (oboe): excerpt from Concerto by Strauss; Willem (drum and nyungwe-nyungwe): traditional/improvisatory (call and response).

[60] The questionnaires are described in section 4.4.2.

4.5.2.2 Lecture 2

All 19 students who had signed up were present at the second lecture, including the 12 IPA participants. The class started with the performances of the two students who had not played the previous week. The lecture content was on musicians' performance health research and background, including musicians' occupation-related disorders, risk factors, prevention and education.

The teaching aims of this lecture were to provide context for the course and foster awareness and understanding of the subject matter by providing information from the literature on the different types of occupation-related disorders and their prevalence rates. Preventative strategies were outlined and the research on prevention education explained.

An activity to facilitate participation, namely a true/false quiz, generated a great deal of lively discussion and responsiveness from the group. The practical component was floor work, utilising an introduction to 'Constructive Rest'[61] from the AT, where all participants lay on the floor whilst I led them through a body awareness and mindfulness exercise, using the AT principles as a guide. This included sensory awareness, tension release, centring, breathing and mental intentions. The journal assignment[62] was introduced in the final 15 minutes of the class. This will be discussed in section 4.5.4.

[61] See explanation of Constructive Rest in Chapter 3, sections 3.3.3 and 3.3.9
[62] See Addendum L: The journal assignment

4.5.2.3 Lecture 3

The third lecture had 15 students in attendance, including 10 from the IPA sample. Lecture content included movement, the senses and awareness, together with an introduction to somatic approaches including BMg. The topic was based on Module 1: 'Movement, the senses, and awareness' from the BMg course, 'What Every Musician Needs to Know about the Body'. This was described systematically in Chapter 3.[63]

Teaching aims were centred on demonstrating four core learning areas in the BMg approach:

- The importance of movement for musicians since all sound is created by movement and the quality of movement determines the quality of the sound.
- The use of the kinaesthetic, tactile, auditory and visual senses.
- The development of an integrated bodily and spatial awareness.
- Identifying one's conception of the structure, function and size of a particular musculoskeletal area in one's body, beginning with the spine as an example.

The practical class exercise focused on kinaesthetic awareness of the spine as the body's central axis of weight bearing and weight delivery. Also presented was a TED talk video[64] about an embodied approach to music-making, demonstrating the experience of artistic music performance with an integrated awareness and utilisation of all the senses. This generated much discussion and curiosity.

4.5.2.4 Lecture 4

There were 17 students present at the fourth class (including 11 from the IPA sample), which was on postural alignment. I taught the fundamental concepts of balanced body use and posture in sitting, standing, playing, singing and movement. This lecture was

[63] See Chapter 3, section 3.3.9, Module 1
[64] Evelyn Glennie: 'How to truly listen': www.ted.com/talks/evelyn_glennie_shows_how_to_listen

based on the content of Module 2, ‘The core of the body and the places of balance’ from the BMg course, ‘What Every Musician Needs to Know about the Body’. This was described systematically in Chapter 3[65].

The teaching aim of this topic was for the students to increase their competency in postural corrections and awareness by identifying six key musculoskeletal regions, whose relationship guides improved biomechanical alignment. These locations are the head (on top of the spine) at the A-O joint, the upper limb, the lumbar spine, the hip joints in standing or the sitting bones when seated, the knees, the ankles and the feet[66].

Practical and experiential movement consolidation was interspersed with the BMg lecture content. The students all participated enthusiastically in the guided movement applications. I ended the class with ‘Constructive Rest’ and covered this in more detail than the previous time as the students had responded positively, indicating their interest to practice it again. Unfortunately, some students had to leave half-way through the class due to an opera production rehearsal.

4.5.2.5 Lecture 5

The fifth lecture, on breathing, had 17 students present, including all 12 from the IPA sample. The theoretical content came from Module 4, ‘Mapping the structures and movements of breathing’ from the BMg course, ‘What Every Musician Needs to Know about the Body’. This was described systematically in Chapter 3[67].

The teaching aim was for students to understand the mechanisms of breathing and to be able to integrate the proprioception of breathing movements and whole-body awareness. My content presentation was followed by practical exercises such as

[65] See Chapter 3, section 3.3.9, Module 2.
[66] See Figure 1, ‘The places of balance’.
[67] See Chapter 3, section 3.3.9, Module 4

experiential floor work in pairs. These experiential learning and consolidation activities (practical, verbal and cognitive) are described in Chapter 3[68]. The class concluded with an excellent 15-minute animated video[69] showing the biomechanics of breathing.

4.5.2.6 Lecture 6

Only 14 students attended the sixth lecture, including 11 from the IPA sample. I taught the BMg content on whole-body support for free arm movement and the legs as dynamic support. The class began with some additional practical consolidation of the breathing lecture that had taken place during the previous week, including the four-handed breathing simulation in groups of four students, and leaning forward whilst seated, with relaxed head, and elbows on knees, feeling the movements of breathing in the lower, middle and upper back, and the sides and front of the torso. This allowed for a smooth transition into the work on arms and legs, with the requisite body and postural awareness.

The theoretical content focused on Module 3, 'The arms', and Module 5, 'The legs' from the BMg course, 'What Every Musician Needs to Know about the Body'. These two modules are described systematically, with the experiential learning applications, in Chapter 3[70] and can be taught together as one lecture when there is a time constraint in terms of the number of allocated teaching sessions available with a class.

The teaching aims were for the students to gain an understanding of the biomechanics of the upper limb, the neutral balance of the shoulder girdle, upper limb mobility, the muscular integration of the upper limb and torso, forearm pronation and supination, and the interaction and coordination of the hip joints, knees and ankles. Practical applications included work on arm movements and their interaction with sitting in or out of balance.

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[68] See Chapter 3, section 3.3.9, Module 4
[69] Jessica Wolf: The Art of Breathing (2013).
[70] See Chapter 3, section 3.3.9, Module 3 and 5

4.5.2.7 Lecture 7

The seventh lecture was an AT class and demonstration, with 17 students present, including all 12 from the IPA sample. The class was presented by the qualified AT teacher, Ingrid Weideman[71], who has extensive experience in teaching the AT and an interest in the well-being of musicians. The decision to have a specialist teach this class was taken to offer the students access to her expertise on the topic. Her lecture included a brief PowerPoint presentation in which she explained the background, concepts and history of the AT, and a description of what a typical lesson comprised, such as table and chair work.

The teaching aims were to introduce the students to the AT through teaching the essential information and experiential application with an AT teacher. During the demonstration, several students took approximately 10-minute turns on the AT 'table' (a little firmer than a physiotherapist's plinth) in front of the rest of the class as she worked with them while explaining what she was doing. There was active participation, contribution and questioning on the part of the students.

4.5.2.8 Lecture 8

The eighth lecture, on performance confidence tools, was attended by 12 students (including 10 from the IPA sample). This was a lecture on performance psychology, which included the following teaching aims:

- To equip the students with an understanding of the cognitive, behavioural and physiological mechanisms underlying music performance anxiety (MPA);
- To increase students' understanding of both facilitative and debilitative levels of MPA; and

[71] Further information on Ingrid Weideman is available at: https://alextechcapetown.com

- To teach a range of skills for developing more confident performance, including embodiment, mindfulness, breathing, integrated physical and psychological awareness, positive self-talk, mental visualisation, perfectionism versus excellence, intrinsic versus extrinsic motivation, resilience, self-acceptance, balanced self-concept, self-growth, humour and joy in music-making.

The content of the lecture was drawn from the literature reviewed for this thesis, specifically sections 2.3 and 2.8 in Chapter 2, together with my own knowledge and experience of teaching these topics to university students over many years. Practical activities included mental visualisation, positive self-talk and spontaneous class discussion on comments and questions raised by the students themselves, resulting in the session becoming very relevant to the students' needs and concerns.

4.5.2.9 Lecture 9

A total of 11 students attended the ninth lecture, including eight from the IPA sample. The topic of this lecture was healthy and efficient approaches to practising, including mental strategies and rest. The literature discussed in Chapter 2, section 2.9.2, provided a basis, together with my knowledge and experience of teaching a variety of practice strategies over many years. A framework suggested by Klickstein (2009), outlining the five categories of thorough preparation, was used as a structure for the presentation: physical, artistic, technical, mental/emotional and organisational preparation.

The teaching aims were for the students to gain competencies in lifestyle and practising, productive practising, thorough preparation and mental rehearsal strategies. The class was highly attentive and the participants asked interesting questions and offered relevant comments during the lecture.

4.5.2.10 Lectures 10 and 11

Both lectures 10 and 11 took the form of a master class in which six students performed, enabling all 12 students in the IPA sample to play or sing. The tenth class was attended by 13 students (including 11 from the IPA sample), while nine attended the eleventh class (including seven from the IPA sample).

The master class format was derived from Module 6, 'Practical application in performance: putting it all together' from the BMg course, 'What Every Musician Needs to Know about the Body', which was described in Chapter 3.[72] The teaching aim was the practical application of the concepts taught in the course, in an informal performance situation. The master class setting enabled the students to play in front of their peers, with input from me on whatever aspect of body awareness, BMg, posture or movement I deemed most important and integrating that with performance.

4.5.2.11 Lecture 12

Eight students attended the twelfth lecture (including seven from the IPA sample), which introduced the subject of hearing health for musicians. The teaching aims were to educate students about noise-induced hearing loss and hearing conservation for musicians. The content, which had been drawn from the literature[73] presented in Chapter 2, included research statistics on the prevalence of music students' NIHL, understanding sound levels and safe exposure time duration, environmental adaptations, earplugs and the importance of education to build awareness. The lecture was followed by an AT 'Constructive Rest' session, focusing on the intentions of the AT and exploring the movements of the arms and legs.

[72] See Chapter 3, section 3.3.9, Module 6
[73] See Chapter 2, section 2.6

4.5.2.12 Lecture 13

The final lecture, which was attended by 17 students (including all 12 from the IPA sample), was used for completing the post-course questionnaires[74] and gave the 12 IPA study sample participants a chance to perform in front of the class and be filmed. For this performance, the participants were required to repeat the same musical item they had presented in the first session (see Lecture 1) and was done for the sake of comparison. This final session concluded the MOHC.

4.6 DATA ANALYSIS

IPA provides a rigorous and systematic qualitative method to analyse in-depth interviews (Biggerstaff & Thompson 2008). Brocki and Wearden (2006) note that IPA analysis starts with, but should extend beyond, a descriptive thematic analysis. IPA researcher requirements are "open-mindedness; flexibility; patience; empathy; and the willingness to enter into, and respond to, the participant's world ... [and] determination and persistence and curiosity" (Smith et al. 2009:55). Whilst the analyst's attention must be centred on how the participants try to make sense of their experience, this is combined with the analyst's explicit subjectivity and reflective process of interpretation (Reid, Flowers & Larkin 2005:20). The researcher's different interpretive levels need to be fluid, varying from being more descriptive and empathic to being more probing, critical and hermeneutic in nature, where the researcher interprets more deeply, always, however, led by the participant's account (Eatough & Smith 2008:189). Reid et al. (2005:22) describe the capturing of the 'insider's perspective' as the initial process, followed by the interpretative process in which "the researcher attempts to make sense of the participants' experiences and concerns, and to illuminate them in a way that answers a particular research question". Reflexivity in IPA is therefore essential in that the researcher maintains awareness of how her pre-understandings,

[74] The questionnaires are described in section 4.4.2.

personal perspectives and experiences are affecting the data analysis (Clarke 2009:39).

The ongoing heuristic, iterative, inductive and reflexive nature of IPA analysis with its detailed coding, organising, integrating and interpreting of the data all lead to the deeper levels of conceptual thinking and interpretation (Smith et al. 2009:80; Eatough & Smith 2008:187; Reid et al. 2005:22). The researcher continually moves backwards and forwards in a cyclical process, through several iterative stages from the preliminary text encounter to identifying themes, developing clusters and creating a summary (Biggerstaff & Thompson 2008). Text passages are therefore repeatedly analysed in light of new insights gained (Brocki & Wearden 2006).

Following a line-by-line analysis of each transcribed interview and then across several participants' accounts, themes and patterns emerge, with "convergence and divergence, commonality and nuance" (Smith et al. 2009:79). Smith et al. (2009:54) discuss the need for systematic data analysis together with allowing "space for reflection, consultation with others, and further development". The complexity, density and sheer volume of experiential data need to be reduced by systematic and rigorous analysis, simultaneously retaining an idiographic emphasis on the particular, whilst capturing the commonalities (Reid, Flowers & Larkin 2005:20).

The analysis of large data sets in IPA may result in some loss of subtle nuances of meaning and IPA studies therefore typically tend towards smaller sample sizes (Brocki & Wearden 2006). This was a challenging aspect in this study as there were 24 transcripts for analysis: an IPA study sample of 12 participants who were interviewed twice. Due to the volume of transcribed interview data, the focus areas of the interview guide provided an initial framework for the analysis. Whilst analysis in IPA is inductive in that codes are not predetermined but, instead, emerge from the text (open coding), the topics in the interview guide provided an outline and a form of 'containment' for the initial familiarisation stage and the first cycle of analysis, using open coding.

Initial immersion in the data begins with reading and re-reading the interview transcripts together with listening to the audio recordings; “entering the participant’s world” (Smith et al. 2009:82). The textual analysis results in notes and comments on the data, which may be descriptive, linguistic or conceptual (Smith et al. 2009:84). This process, which involves the use of the computer-aided qualitative data analysis software (CAQDAS) programme, ATLAS.ti, is called coding, which “refers to the process of assigning categories, concepts or ‘codes’ (more generally speaking) to segments of information that are of interest to your research objectives” (Friese 2014:24). In describing the sequential nature of coding by means of ATLAS.ti, Friese (2014:17) asserts that initially the focus is descriptive as you “notice interesting things that you begin to collect during the initial first-stage coding”; this is followed by further development of the code list, “with the aim of describing everything that is in the data, naming it and trying to make sense of it in terms of similarities and differences”.

The structured code list, which will then continue to be refined, is applied to the rest of the data, together with comments and memos, in several cycles of “noticing and collecting until the coding schema is fully formed” (Friese 2014:17). The initial master list of codes or themes from the first interview is used in the next interview analysis, with the addition of new codes on each new interview as they emerge, always in a cyclical process. As later findings develop, the initial thematic analysis is gradually modified and adapted (Biggerstaff & Thompson 2008). The conceptual analysis phase follows and, according to Friese (2014:18), “the aim now is to look at the data from the perspective of the research questions by approaching them from a different angle” and “to identify patterns and relations in the data, and to see how various aspects of the findings can be integrated”. This conceptual stage is the move away from the more descriptive codes, categories and themes to ‘super-ordination’, the interpretative stage (Biggerstaff & Thompson 2008).

In discussing the interpretive aspects of IPA and its differences from broadly descriptive standard thematic analyses, Hefferon and Gil-Rodriguez (2011:756) affirm the need for good quality IPA analyses with considerable depth and interpretation and,

in general, a smaller number of themes. Larkin and Thompson (2012:112) advise that the IPA analysis:

> transcends the structure of the data collection method (e.g., the schedule for a semi-structured interview); focuses on 'how things are understood', rather than on 'what happened'; incorporates and balances phenomenological detail (where appropriate) and interpretative work (where appropriate) to develop a psychologically relevant account of the participants' 'engagement-in-the-world'.

Smith et al. (2009:84) emphasise that "it is important to engage in analytic dialogue with each line of transcript, asking questions of what the word, phrase, sentence means to you, and attempting to check what it means for the participant". The more conceptual level of analysis becomes more abstract and usually seeks to identify "the participant's overarching understanding of the matters that they are discussing" (Smith et al. 2009:88). As the themes emerge, they should reflect both the interviewee's account and the researcher's interpretation, encapsulating a clear understanding (Smith et al. 2009:92). According to Eatough and Smith (2008:187), "ideally the final narrative should move between levels of interpretation: from rich description through to abstract and more conceptual interpretations". This systematic qualitative thematic analysis of the interviews, acknowledging the researcher's interpretation, becomes a rich and nuanced narrative account (Smith et al. 2009:4).

'Good practice' and integrity in qualitative research is necessary, and 'quality control' standards have evolved which provide evaluative guidelines for qualitative researchers (Elliott, Fischer & Rennie 1999). The aim of validity checks in qualitative studies is to ensure credibility (Brocki & Wearden 2006). Reid et al. (2005:20) summarise key facets of a successful IPA analysis: "interpretative (and thus subjective) so the results are not given the status of facts; transparent (grounded in example from the data) and plausible (to participants, co-analysts, supervisors, and general readers)".

Yardley (2000:219) documents four principles for assessing validity and quality in qualitative research which are also applicable to IPA: "sensitivity to context; commitment and rigour; transparency and coherence; and impact and importance".

Other authors agree with these criteria (Larkin & Thompson 2012; Shinebourne 2011; Smith et al. 2009; Elliott et al. 1999). Sensitivity to context involves aspects, such as relevant literature, the interactions with participants, being meticulous with the raw data and ethical considerations, all of which were ensured in this study (Shinebourne 2011:26; Yardley 2000:220). My sensitivity to context was also enabled through my vast experience as both music educator and performer, together with my knowledge and professional training in musicians' health. This interdisciplinary knowledge and experience provided an empathic professional understanding. Commitment and rigour were shown in this research through prolonged and in-depth engagement in the study (Yardley 2000:221). Rigour denotes "the thoroughness of the study, for example in terms of the appropriateness of the sample to the question in hand, the quality of the interview and the completeness of the analysis" (Smith et al. 2009:181).

Transparency refers to having a clear description and argument, with transparent methods, whereas coherence refers to the data presentation, as well as a good match of the study aims, method and analysis (Shinebourne 2011:27; Yardley 2000:222; Elliott et al. 1999:228). Transparency and coherence were achieved by following and monitoring the methodological procedure of IPA. Typically, transparency in qualitative research is demonstrated through ongoing documentation of the research process as an audit strategy, from the initial notes on the research question and proposal, through to the analysis and write-up. This is most commonly done as ongoing mini-audits by the research supervisors (Shinebourne 2011:28), which was accomplished in this study. In this research, transparency was also enabled, using ATLAS.ti, which allows the trail of the analysis to be traced from the initial coding of interviews to the final thematic structure. Larkin and Thompson (2012:112) describe how transparency is also achieved through appropriate and thorough use of data extracts and commentary. Some form of triangulation is suggested, such as having the analysis checked by another researcher or research supervisor as cross validation, or through the use of multiple data sources (where possible and appropriate to the study design) to provide convergence across data sources (Mertens 2015:444; Reid et al. 2005:23). In this study, this was achieved through regular checks by the research supervisor. Strategies, such as audits, participant-checks and triangulation are referred to as

"providing credibility checks" to achieve trustworthiness (Larkin & Thompson 2012:112; Elliott et al. 1999:228). Member checks, also known as participant validation, can be done during data collection and at various other stages of data analysis and writing (Mertens 2015:446). To ensure credibility and trustworthiness in this study, participants were asked to validate their interview transcripts which had been sent to them. They were advised to check for accuracy, to correct where necessary and, for confidentiality, to remove any content that they did not want to appear in the public domain.

The impact and importance of the research must be assessed relative to its objectives, in terms of both theoretical and practical applications (Yardley 2000:223), and whether it is engaging, useful and interesting for the reader (Shinebourne 2011:27; Elliott et al. 1999:229). The impact and importance of this study have already been recognised. The research and its preliminary results were accepted for presentations at the Congress of the South African Society for Research in Music (SASRIM) in Cape Town, South Africa (2015), the Andover Educators Biennial International Conference in Portland, USA (2015), the Performing Arts Medicine Association (PAMA) International Symposium in Colorado, USA (2017), and the National Performing Arts Health Symposium in Pretoria, South Africa (2017). The article *Towards a model for musicians' occupational health education at tertiary level in South Africa* was also accepted for publication in *Muziki: Journal of music research in Africa (2016).*

Additionally, Larkin and Thompson (2012:112) emphasise several other characteristics of good quality IPA research, including appropriate data collection; a balance between an idiographic focus and shared aspects; and "appropriate understanding and implementation of transferability issues". The term 'generalisability' is used in quantitative research when the study's findings are generalisable to a wider population represented by the study sample. The term 'transferability' is used in qualitative research and implies that the research results can be transferred to other similar contexts or provide insight into similar situations (Mertens 2015; Given 2008). As Mertens (2015:445) highlights, "the researcher is responsible for providing the thick description that allows the reader to make a judgment about the applicability of the

research to another setting". In IPA, it is essential that the focus is on the transferability of findings rather than on generalisation (Hefferon & Gil-Rodriguez 2011:758).

4.7 SUMMARY

This chapter provided an overview of the research methodology implemented in this study. Underscored by the interpretive paradigm, a qualitative descriptive design with a hermeneutic framework was adopted. The specific approach, IPA, was chosen based on the research aim, which is to understand what a musicians' occupational health course incorporating BMg would be like for tertiary music students, by exploring their experiences with regard to their participation in the course.

A narrative explaining interpretivism and qualitative research was followed by a detailed account of IPA with reference to its phenomenological, hermeneutic and idiographic foundations. The sampling and recruitment strategies were outlined, and the 12 study participants introduced. Semi-structured interviews as the main data source was explained along with a description of the interview process followed in this research. The questionnaires and journals, which were the additional data collection methods, were described. The ethical considerations, including ethical clearance, informed consent, confidentiality, consequences and the researcher's role, bias and assumptions were discussed.

The next section described the MOHC: the teaching aims, theoretical content and experiential learning applications for each lecture were presented. The analytical procedures of IPA were explained with reference to the IPA methodological literature. Principles integral to the assessment of quality and validity in qualitative research were also highlighted. The results from the data obtained through the research methods outlined in this chapter will be presented in Chapter 5.

CHAPTER 5
RESULTS

5.1 INTRODUCTION

This chapter provides an analysis of the 24 interview transcripts of the 12 participants, using IPA as the method of data analysis. The interview data was collected by means of semi-structured interviews, which were held both before and after the course. The data analysis resulted in four super-ordinate and 20 subordinate themes, each of which will be conveyed in a distinct section in this chapter. The account fuses the thematic descriptions with the raw interview extracts and my analytic narrative, as well as my observations and reflections as the researcher. The data from the three questionnaires, which were collected as supporting descriptive and contextual information for the IPA study, will then be presented and briefly discussed.

5.2 ANALYSIS OF INTERVIEWS, USING IPA

The initial free coding of the pre- and post-course interview data, using Atlas.ti generated 19 pre- and 21 post-course codes. The pre-course codes were grouped into three thematic clusters, namely background, awareness and performance. The post-course codes were also developed into three thematic clusters, including content, awareness and performance. (Please refer to the graphic representation in Figure 5-1 for the initial pre- and post-course coding diagram, which illustrates the preliminary phase of analysis.)

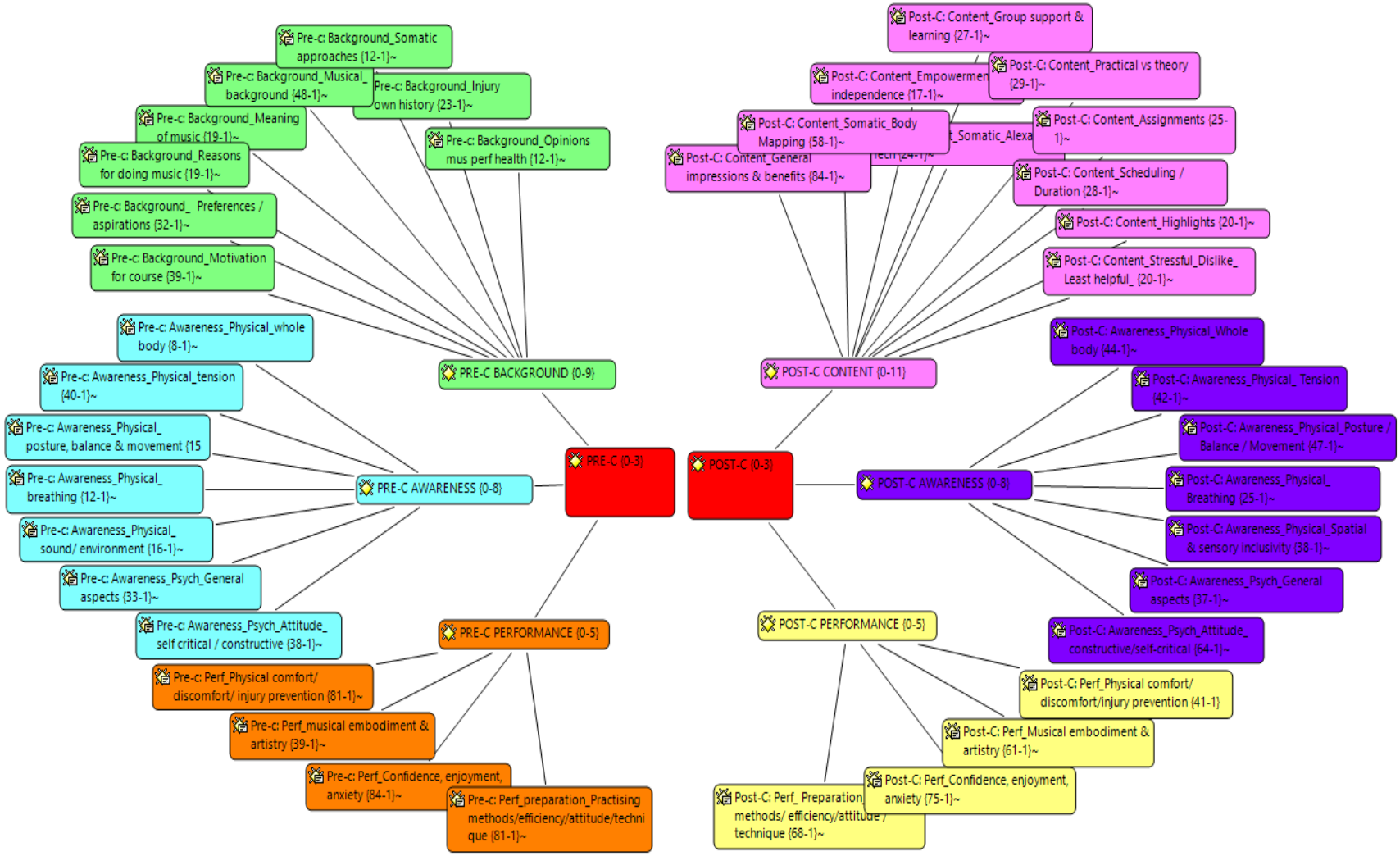

Figure 5-1: Initial pre- and post-course coding diagram

Deep and extensive immersion in the data, engaging with the participants' meaning-making and adapting the initial coding structure proceeded in a continuous inductive, iterative, heuristic and reflexive manner. The detailed descriptive coding gradually became more streamlined, organised and assimilated, leading to richer conceptual understanding and more nuanced interpretive thinking. (Please refer to Addendum Q, where this development is represented schematically in the form of three comprehensive tables illustrating the process of integration and the resulting emergence of the super- and subordinate themes. A summary of the final thematic structure is displayed in Table 5-1.)

Table 5-1: Summary of IPA thematic structure

SUPER-ORDINATE THEMES	SUBORDINATE THEMES
Panorama	Meaningful musical identity sets the scene Eager to acquire preventative knowledge and skills Integrating valuable tools and broader understanding Enabling perspective and compassion through group diversity Body Mapping opened my mind to my body Course appraisal commentary
Physical awareness	The whole me Appropriate tension release Postural and movement choices Physical ease and freedom Allowing myself to breathe Auditory, kinaesthetic and spatial integration
Psychological awareness	Attitudes Self-evaluation capacity and constructive acceptance Performance anxiety: debilitative and facilitative Performance confidence and enjoyment
Musicianship	Inconsistent practice Productive practice Musical disembodiment Musical embodiment

5.2.1 Panorama

The super-ordinate theme ‘Panorama’ provides an overview of the students’ experiences with regard to their participation in the course from several angles and explores six subordinate themes:

i. Meaningful musical identity sets the scene;
ii. Eager to acquire preventative knowledge and skills;
iii. Integrating valuable tools and broader understanding;
iv. Enabling perspective and compassion through group diversity;
v. Body Mapping opened my mind to my body; and
vi. Course appraisal commentary.

5.2.1.1 Meaningful musical identity sets the scene

An emotional attachment to instrument, authenticity of self and a strong life-long musical identity were evident among all participants. This powerful connection occurred as a relationship with music itself, being a musician and the instrument or voice. Jayden claimed that “Music is like one of those things that I'm gonna [sic] have for the rest of my life you know, whether I lose a finger or whether I carry on playing, it’s just gonna [sic] be there”. Music was viewed as dependable, consistent, communicative, powerful, deeply spiritual, and providing positive challenges and discipline. Mandla stated, “I guess it’s the only thing I feel I’ve ever been able to rely upon consistently. In terms of, you know, my emotional state.”

While a future in music was identified as a goal of all the participants, individual participants had specific musical aspirations. These were defined as teaching, composition, arranging, solo or group performance, music psychology, music therapy, improvisation and the development of self-identity through music. A few of the students mentioned teaching music to young children and the joy, creativity and fulfilment they envisaged as a result thereof. Sustainable social development, through inclusive creativity and learning projects in the performing arts, specifically music, was also

included.

The students had been drawn to music in many ways, with several mentioning supportive family and friends. The collaborative aspect was a frequent motivation as it created feelings of connection, community, sharing and inspiration. Wendy asserted, “It’s just really enjoyable because you feel like you have a connection with other people. You’re not alone somewhere.” Performance was portrayed as interactive, communicative, exciting and expressive. Being inspired by a teacher or particular artist was an important factor, yet a student who spoke about having a highly-critical and negative teacher had continued due to her own strong intrinsic motivation. This inherent desire for and need to do music was common and music was described as a universal language, bringing happiness, beauty, upliftment and pure enjoyment. Dorothy confirmed that it provided “a whole new world”.

Music was deeply meaningful for these young musicians. It played a vital role in their lives, demonstrating their roles as committed and aspiring musicians-in-the-world. This understanding set the scene for exploring their experiences with regard to musicians’ occupational health training.

5.2.1.2 Eager to acquire preventative knowledge and skills

All of the interviews indicated a common general curiosity about musicians’ health-promotion. Almost all of the students (10)[75] were interested in the causes, prevention and rehabilitation of injuries. As Wendy illustrates, “… so, it’s about a healthy way of playing not just, like, dealing with a problem as it comes, but actually preventing a problem in the first place”. The participants displayed a sincere openness to and keen readiness for the course content despite tending to be unsure of exactly what to expect as it was the first time a course of this nature was being offered at the university. Seven of the students were motivated to attend the course because of their own discomfort

[75] The figure in brackets refers to the number of participants sharing this opinion.

and playing-related pain. As Frank remarks, “Just knowing what is actually going wrong and what can I do to fix it so that it doesn’t keep recurring.”

Ten of the students perceived musicians’ occupational health as being a relevant, necessary and an important area. Khanyi affirmed that “…a lot of musicians and also students experience music-related injuries so this is very vital that we know how to deal with it.” Bongi commented that the area of health promotion and injury prevention is neglected, suggesting that it is the result of most teachers not really thinking about it. Frank explained it more decisively as follows: “Well, as a twenty-three-year-old, I feel like I should know more than I do and so I feel that it’s something that’s not been emphasised enough. I think it’s very important, like, *very very* important.”

Jolene comments on her frustrating experience of trying to acquire strategies for injury prevention and performance improvement: “I really... I ask so many questions from everyone else and nobody has, like, a clear set of rules or, like, a plan. I don’t know, maybe they just don’t want to share their success!” The challenges with regard to obtaining advice, correct diagnoses and treatment, as well as the lack of understanding among medical professionals were illustrated by Mandla:

> I think that’s the biggest problem, is that a lot of people who experience problems like repetitive strain injuries don’t really know where to begin in figuring it out. They kind of hear what everyone tells them. …you know, 99% of the doctors you go to don’t actually play an instrument.

Regarding prevention approaches, although two students were not at all aware of injury prevention methods, 10 of them had tried certain strategies. The need for postural efficiency and reducing tension was described by six students, although this was based on their theoretical knowledge rather than on experience. Exercise and body work (including jogging, push-ups, arm strengthening exercises, warm-ups and stretching) were done by eight students. Two students participated in somatic methods, namely the AT and yoga. Medical intervention, specifically physiotherapy, was described by two students, while two were aware of using ergonomically-appropriate neck straps for their instruments. Two students were interested in healthy

nutrition. Psychological awareness skills, namely the development of a positive mindset and taking personal responsibility, were mentioned by four of the students. Six students described using sensible practice approaches, but these were limited in scope and somewhat vague, such as breaks in practice sessions (six), having one rest day per week (one), varying the type of practising (one), mental practice (one), and changing technique if uncomfortable (one), as Max states: “During practice, when you start feeling some discomfort, you just stop and attend to it.” Malika emphasises her desire to try to relax: “So just learning to relax; I need to start to learn to relax.”

It was unclear as to how helpful, focused or appropriate these strategies were or whether the students were able to integrate them into their playing or singing or whether they were able to utilise them in a preventative or rehabilitative way. It was, however, evident from all the interviews that the participants wanted knowledge and skills with regard to preventative measures in the following areas: awareness (three), posture (three), tension reduction and freer movement (three), performance confidence (three), freer breathing (three), body-mind integration (two), and body-conscious teaching (one). Four of the students mentioned an interest in improved whole-body use as shown by Khanyi, who expressed the need “… to be more connected with my body when I’m performing”. Six students expressed the wish to find out more about somatic approaches and learn about BMg. The two students who had done prior introductory BMg workshops wanted to do a longer course which incorporated BMg in more depth.

A profound and urgent ‘need to know’ collectively underpinned all the students’ accounts as they expressed their perceptions of their motivation to join the course. Not knowing represented feelings of disempowerment, frustration and hampering progress.

5.2.1.3 Integrating valuable tools and broader understanding

After the course, many students explained that they had acquired valuable tools that they could take away with them. The initial feature was the participants' sheer sense of relief that their occupational health needs were being recognised. This was followed by some apprehension, and then the emergence of a more mature grasp of the long-term responsibility and commitment required. An important shift to a broader perspective occurred in terms of their contextualisation, understandings and meanings of their own biopsychosocial health, conceptualising their specific performance health issues as part of 'the bigger picture'.

A culture of openness, acknowledgement, deepening understanding and teaching preventative tools are integral to musicians' health promotion and this was apparent during the course as illustrated by Khanyi in the following extract:

> …it's this thing that you're not meant to talk about, you're not meant to get, feel pain from practising or, you're just meant to practise all the time, but obviously that comes with massive implications, emotionally and physically so, even just having that space to talk about it and to have those tools…

Yet health promotion skills and knowledge acquisition take time, practice and implementation. Willem described how his understanding of this long-term process had grown during the course. He had imagined a "…short-term process of transformation. …but I also now see that the process is a much longer one, and there's no quick fix". This realisation of a longer-term commitment to change caused Max to experience initial shock:

> That hit me. That hit home that 'you know what? Okay, I think you need to go back and just start from scratch'. That got to me. ...because change is good, but just that thought of going back to square one.

The course broadened the participants' knowledge and awareness of the health promotion and injury prevention options available for them so that they could later pursue avenues according to their preferences and needs. Mandla explained this in his own way: "…almost like, someone has cracked open many doors that I can now

go and pick which ones I want to open at what time." Similarly, Bongi described that it answered many of her questions and led her in the right direction for further learning. This extract demonstrates Jayden's perception of the comprehensive breadth in the course: "Well, obviously, I came in not knowing much and especially Body Mapping you know, it's like my eyes have been opened rather than me just learning a few more things, so it's really helpful."

However, this theme also revealed unique individual needs, preferences and understandings as the students revealed their perceptions of the specific tools and strategies they had learnt. For Wendy, the course opened areas that could be explored further at her own pace, such as mental practice. In addition, she felt that she had learnt skills that she could use immediately. For Max, whole-body awareness stood out as it had helped him to expand his awareness in general, helping him with mental aspects. Dorothy felt that the course had contributed in terms of reducing her mental stress and physical tension since the two are interlinked. She was of the opinion that "It opened my mind to more viewpoints". The course was valuable for Bongi as she found a more positive approach to practising, reduced her pain and discomfort during playing, lowered her stress and tension, and was already using some of the concepts successfully in her teaching. The main benefit for Willem was the awareness of the whole body delivering the sound together with the promotion of psychological health and well-being. Jolene also particularly enjoyed the integration of physical, mental, and musical aspects, and discovered that "there are so many aspects that rely on each other, that affect each other," as she had tended to "compartmentalise".

Many students enjoyed the comprehensive course content. Khanyi declared, "Ja [sic], I found it extremely, extremely eye opening, extremely useful information that you were giving us each week." Dorothy experienced the extensive content as an opportunity to explore the entire area, which had been supported by research:

> I think it was really great. I loved the fact that each lecture was on a different subject …it was a very broad thing that people could go and explore more in depth and also the fact that it was practical, as well as theoretical, and the fact that you brought all the studies and research.

Similarly, Frank and Dorothy expressed the opinion that it is part of understanding the much broader yet essential needs of musicians. Dorothy stated, “I think that we tend to focus on music alone and not consider the bigger picture, so I think it’s very important to have something like this.” Likewise, Frank emphasises that “It’s bigger than just this music thing”, and describes the course as very beneficial as this knowledge would help him to be a better all-round musician. The impact of a generally healthy lifestyle was experienced by several students as Khanyi indicates: “Definitely made me more aware of just everyday things you know.” Mandla illustrates the breadth:

> It explored most of what I was expecting and more than that. I wasn’t expecting to go into things like hearing loss and protecting your hearing and I wasn’t expecting to go so far into things like Body Mapping and it kind of helped me understand the relevance of things like that. ... the relevance of Body Mapping and that kind of approach, Alexander Technique and all of that. I had no understanding of that beforehand, at all.

Eight students felt that this kind of course is definitely beneficial to music students. While Dorothy described it as “imperative”, Willem referred to it as “fundamental”. Both Frank and Mandla commented that it is extremely important and should be emphasised more. Mandla encapsulates the importance of the preventative tools and the broader understanding associated with them:

> You can’t train a set of musicians without telling them what they need to watch out for, you know. Otherwise, you’re essentially sending them into a dark room and they don’t even know what’s in there besides for glory, fame and you know, millions and stardom *[laughing]*. I think it’s crucial.

5.2.1.4 Enabling perspective and compassion through group diversity

The diversity of class attendees provided a positive experiential learning environment. The participants were initially reserved in the lectures because it was unusual in that it was a mixed class of students from different sections (jazz, opera, African, and Western art music) and study streams (performance, general and musicology) within the music department, as well as a range of academic year levels and instruments.

However, by the third lecture, they were comfortable and settled in the group, and from then on, they were participatory, animated, enthusiastic and engaged. This created an involved and dynamic learning environment in which there were frequent 'aha' moments, demonstrating keen insight and discoveries. I also observed that students' increased engagement and spontaneous participation resulted in the lecture content becoming highly relevant to their needs and concerns.

The participants' accounts revealed that nine had experienced enjoyment with regard to the variety in terms of year level, age, instruments, voice and genre in the class. Not only did this enable them to learn from one another, but it also allowed for the emergence of deeper understandings and a wider perspective. Willlem's comprehensive description of what it was like for him was echoed by several other students:

> What I did enjoy a lot was encountering different people and a lot of the people doing the course were from different fields of musical study and all with sort of different problems … and seeing people's problems and relating them to my own. Sort of the, the compassion that comes from group work, I think that was a good experience for me, even just the stories, hearing people's stories. …and people sort of sharing and it's one of the more unfortunate things about being at a university is that somehow people get very stuck in the boxes of what they do and specialise in …

Nine students commented on the value of the supportive group setting in which they could have class discussions, play or sing in front of and learn from one another. Wendy really liked the fact that everyone had attended in a very open-minded way and remarked that "I felt that it was a very free space to say what was on your mind". In general, they felt it was supportive, encouraging and non-judgmental. Khanyi noted, "…just hearing the specific stories or whatever just makes you feel like you're not alone in the situation."

Bongi observed that everyone was willing to talk and share which was "…so different from all the other classes where nobody gives anything", and "it was a nice group of people; they weren't worried about like who was better or maybe it was because there were so many different genres". The meaning here is powerful and reflects all the participants' appreciation and need for mutually respectful, accepting and supportive

behaviour towards one another. This suggests that the underlying insidious aspects of competition in practical music studies are not acknowledged or addressed openly enough.

5.2.1.5 Body Mapping opened my mind to my body

The incorporation of BMg as the somatic educational approach was perceived as highly valued and beneficial, and the participants all had positive experiences with regard to this component. The well-defined body consciousness, reinforced with accurate relevant anatomical content and proprioceptive skills training, led to a knowing which responded to their fundamental 'need to know', which was previously discussed. BMg was therefore empowering as it facilitated access to corporeal knowledge and understanding which could be assimilated with the multiple physical, psychological and musical requirements of music performance. These will be discussed in more detail under their specific thematic sections: physical awareness, psychological awareness and musicianship.

I observed the students' keen participation in practical activities, motivation to learn and genuine engagement with the material during classes. This was evident, for example, in the master classes. These were more challenging for some students than others, yet everyone participated with enthusiasm and conviction. Contributions from the class in the form of questions, observations and discussion were constructive and insightful. The experiential exercises and activities during lectures, such as for breathing, balanced posture and sensory awareness, were done enthusiastically and attentively.

BMg was perceived as a good way for musicians to learn appropriate anatomy as illustrated by Dorothy: "Well, the Body Mapping sessions were great ... because I often thought that musicians should study anatomy … the Body Mapping is probably even a better way of doing it". Likewise, Jayden commented, "I think it's everything a musician should know, and I think I have kind of opened my mind to my body because we are doing physical things where we actually need to know what's going on." Two

students expressed their dislike for certain aspects of the skeletal anatomy, yet both described BMg as both interesting and beneficial. Frank illustrated this by referring to the skeletons as a real “turn-off”, but stated that the section on the breathing structures and mapping the mouth and throat were important and relevant to his needs. Seven other participants also mentioned that BMg was helpful for improving breathing awareness.

The link between understanding the anatomical information and developing the kinaesthetic perception of their own body was made by Mandla and Dorothy. Dorothy said, “The kind of having a view in your head of things … or where your hip joint actually is. All that kind of thing … it’s correcting the incorrect maps that I found most helpful.”

Almost all of the students (10) understood and experienced the impact of the BMg principle of bodily kinaesthetic awareness, which Wendy describes as follows:

> I feel like everything kind of links into that because you can have, you know, all the confidence in the world, but I think that if you have good body awareness then it helps you to like when you want to make a big sound, to help you make a big sound. And when you need to do a technical passage, it will help you to do a technical passage. And it helps you practising because you can evaluate what you’re doing physically that it’s either working or not working.

Frank, a clarinettist, highlighted how BMg had improved his understanding of how smaller parts relate to the whole: “… you can see why it’s important to look at the whole because everything is connected”. He had found it particularly helpful to map the mouth, throat and tongue. In terms of releasing tension and having whole-body awareness, Gabrielle illustrated her experience of BMg as follows:

> … it made me realise that like your whole body has to actually be … feel free and you, and even knowing … with knowing where the joints are and things like that, and when we think of them and knowing where they actually are actually helps with the loosening up and not having tension.

Six participants found it very helpful to know how the whole body works physically in order to achieve technical needs, solve problems and reduce both mental stress and

muscular tension. The role that BMg played in minimising tension was mentioned by 10 participants. Dorothy illustrates:

> I think a lot of musicians feel like they can't produce what they are feeling; they can't express what they are feeling because they lack the technique and I think that's what contributes to a lot of the stress, whereas the body mapping helps you to understand the technique and it helps. Well, it certainly helped me to see that technique is not about strength so much as efficiency …

With regard to postural balance and alignment, six participants described BMg as beneficial and five explained that learning about the spine as the core was constructive. Balanced postural awareness and breathing was experienced as particularly helpful for both singers as they found that it had reduced their stress regarding technique and complemented their vocal lessons. Reducing tension in the neck and throat area through finding a balance at the atlanto-occipital joint was perceived as significant for vocal ease and feeling more centred.

Gabrielle describes how BMg provided her with specific ways of solving problems that her teacher had been working on with her: "… it definitely did help. It's like it … helps fix the problem that you have, that you are being told to fix but you don't know how to fix it". Malika experienced a reduction in stress because BMg gave her clearer information regarding her singing than the frequent metaphors used in vocal pedagogy: "... the fact that I can see everything from a medically realistic point of view, straight like, *fact*". She feels less stressed and "everything fits into place now". Malika explained that BMg clarified and consolidated what her teacher had been doing with her:

> … you have got your teacher going, "Okay, now you need to support and you need to do this", and you're so focused on doing everything right that you're not quite sure what you're actually doing, and just seeing for instance … it was just putting a visual image to what teachers have been telling me; it just makes me feel more relaxed.

Outcomes such, as reduced psychological stress and feeling more embodied and connected were also described by Jolene, who states that the BMg master classes, breathing class and individual sessions had the most impact on her: "BMg more than anything just allows me to analyse a space and find my place in that space in a

comfortable way ... Not feeling out of control of my body, not feeling like I'm going to fall over ..."

Pain reduction was described by two students as a benefit of BMg. Bongi, a violinist, found that the BMg content on postural balance in sitting reduced her discomfort as she no longer has pain during orchestral rehearsals. Electric bassist, Mandla, described feeling sceptical at first and then admitted that he had found BMg very helpful as his pain had decreased significantly. He was able to play more comfortably as BMg enabled him to improve his arm biomechanics, reduce tension and increase stamina. The BMg content on the arms was beneficial to five participants. Khanyi describes taking the BMg principles and tools into the practice room. Dorothy, a pianist, found that BMg had greatly complemented her private AT lessons.

5.2.1.6 Course appraisal commentary

This subordinate theme, which is more descriptive by nature, is a clustering of students' evaluative feedback, critique, highlights and thoughts on the content and structure of the course.

Nine of the participants felt that a whole year, rather than only one semester, was preferable for this kind of course as it would allow for consolidation, practical sessions, master classes, discussions, movement activities, experiential learning and their own practical applications. I also observed that it took time for the students to understand, integrate and implement the material in practice and performance, each in their own way, at an appropriate pace and according to personal relevance. It was therefore evident that a longer period of participation in the course would be more valuable.

The most appropriate year level of participation in musicians' occupational health training and whether it is compulsory or optional are debated topics which require further investigation. Three students believed it would be best for first-year students. Jayden felt very strongly that it would be most valuable during the second year of study as it would allow students to settle in during their first year. In contrast, Dorothy

suggested that it should not be mandatory at a specific time during their musical training, but that it should rather be an elective course because if students were “forced to be there”, readiness, motivation and interest may be lacking in some, which would change the dynamics of the class:

> So that the people who really want to benefit from it can then take it because I think if you try to teach people who aren’t interested in it yet, it’s probably just going to waste their time because I don't think they will really be appreciating the benefits of it.

The practical and experiential learning processes were significant in terms of their impact on the students. In general, they all commented on how much they had enjoyed the practical sessions and how much they had learnt from that kind of consolidation. Their accounts provide important confirmation of the importance of the experiential components of performance health training in order to achieve embodied knowledge. Nine of the students would have liked to have had more practical learning opportunities in the form of more practical playing, master classes and practical activities related to the theoretical aspects. Three of the students commented that although the balance of theory and practical was sufficient, they would have enjoyed having more master classes and individual sessions. Similarly, Dorothy suggested that some individual AT lessons would be a helpful addition.

The students’ response to the journal assignment was poor. Most of them did not like it and were unenthusiastic about it. This resulted in very few having been produced. I observed that many students did not do them properly, had found the process very challenging, did not ‘get around to it’ or simply did not like it at all. I speculated that that the poor response may have been due to the non-credit, optional and voluntary nature of the course and that the associated course requirements were therefore not compulsory. Eight of the participants, who described having tried it, although very minimally, understood the purpose of the exercise. They found it to be a helpful process as it had taught them skills, such as experimentation, evaluation, awareness, self-observation and constructive criticism. They referred to it as challenging because it pushed them to evaluate what they were doing in practice and to engage in problem solving (8). Two students found it stressful, and Dorothy described it as too personal

for her to do properly. Four participants said they were simply too lazy to do so as the course was not for credit and there was no consequence for not keeping a journal. Their honesty revealed a trend that was most likely true for most of the students, implying that it was a demanding task, but would have been achievable with the right level of motivation, structure and self-discipline. They explained that it would have been different if it had been a formal credit course with compulsory assessment requirements.

The students gave interesting feedback regarding the course content. Both singers (Malika and Gabrielle) mentioned that some of the course content was not relevant to singers but was more appropriate for instrumentalists, suggesting a need for more focused courses. The electric bassist and double bassist (Mandla and Max), both jazz musicians, found the hearing protection class least helpful because they were already well-informed about the topic. Yet they both felt strongly that it should still be included as they were very concerned about the lack of hearing conservation awareness among most students. Wendy suggested that hearing protection may be better dealt with by a medical practitioner, who could give a more specialised lecture and do hearing assessments, allowing for baseline and follow-up measurements.

I am of the opinion that presentations by guest lecturers from specialised fields are necessary. I observed that the students responded very positively to a visiting lecturer with specialist knowledge in the AT. The AT group session was described as beneficial by seven students. In contrast, Jayden did not find the AT class useful for his needs and stated that “It wasn’t that appealing to me”. The AT session made a strong impression on Malika and was a highlight for Mandla, who particularly enjoyed the way he had felt after his session on the table:

> When the Alexander Technique teacher came, definitely. I found the table work that she did *very, very* cool and just generally the work that she did was very, very cool … After having that very short session, it was kind of quite enlightening because what she did to my neck, the way she was pulling my leg and all of that really loosened up my spine … I came off the table feeling quite light.

Nine students described how they had liked the AT constructive rest very much (with five of these mentioning it as a course highlight) and explained how they were already able to use it themselves. I noticed during the classes that the constructive rest (which was incorporated into several lectures) was always keenly participated in. This was significant as it indicated their enjoyment of ‘slowing down’, mindfulness and releasing tension.

5.2.2 Physical Awareness

This super-ordinate theme encompasses the participants’ collective experiences, perceptions and understandings of their corporeality and explores six subordinate themes:

i. The whole me;
ii. Appropriate tension release;
iii. Postural and movement choices;
iv. Physical ease and freedom;
v. Allowing myself to breathe; and
vi. Auditory, kinaesthetic and spatial integration.

5.2.2.1 The whole me

The shared experiences with regard to whole-body awareness revealed a sense of integration, connection, coordination and syncronicity. In the context of the course, the conceptual awareness of ‘the whole me’ allowed for considerable improvements in understanding complete and integrated body use.

Prior to the course, five students described wanting more whole-body awareness and improved coordination. A sense of frustrating limitation was revealed as expressed by Mandla: “…knowing that one thing affects the next”, and Dorothy: “I don't really know how, I've always felt like I don't have much awareness with my body, so I don't really

know what to do to get a piece right when it's fast". Frank commented on wanting to integrate musical and technical aspects with whole-body awareness. Malika described her body as feeling "unnatural" because of required techniques, and Willem felt unbalanced due to uncomfortable movement adaptations after a prior injury.

After the course, 10 of the students described having experienced improved whole-body awareness with powerful benefits, as suggested by Max: "…by making me aware of the whole me, the whole body, how my whole body should be part of my bass when I'm on stage. How everything should be in sync when I'm on stage; that just made everything easy for me." The results of whole-body awareness experienced by the participants included reduced tension, enhanced sound, better technique, easier coordination, increased stamina and improved support.

Several students spoke about and understood the concept of the connection between the parts to the whole. Gabrielle stated, "I was more aware of what I was doing and that it was like, a function of the whole body and not just like my voice and my vocal chords." Improved support and stamina were exemplified by Dorothy who perceived that "…whole body and all of that, and just to approach everything from that, that kind of idea, it makes such a difference and your stamina is much more and you can … do stuff for much longer". Max described his euphoric experience of whole-body awareness: "That was the best thing ever because applying that when you perform, that is the best feeling you can ever get." Willem also experienced the positive gains and stated, "I think that a lot of the time that sort of body consciousness is not really built into the music education system and it should be".

The underlying implication is that the students had previously felt a disconnection between the parts and had a tendency to focus on them in isolation from one another. The developing awareness of a connected, inter-dependent, and inter-related body had a profound impact on reducing limitations in terms of technique and coordination, therefore improving ease and results in performance.

5.2.2.2 Appropriate tension release

Restrictive tension is a barrier to comfortable and efficient performance, while appropriate tension release allows for efficient biomechanics and appropriate exertion. Prior to the course, kinaesthetic, cognitive, musical and technical awareness issues interacted in the manifestation of excessive muscle tension in the students. Three of the students spoke about not being aware of muscle tension whilst playing (during practice and/or performance), but instead only realised it afterwards. This indicates that they had experienced the impact of tension, but were unable to perceive the increased muscle tension itself during playing. Mandla said, “I can understand that tension can be perceived mentally and emotionally while playing. I don’t really pay much attention to it though, so I don’t really know how.”

Seven of the students were, however, conscious of heightened muscle tension during playing or singing but felt unable to ‘relax’. Consequently, some became frustrated, while others experienced restricted breathing, and some became over-analytical, all of which exacerbated the discomfort and tension. As Wendy described:

> I know I’m tense, but I don’t know what it is that I need to do to stop being tense … it usually happens after some time, and usually it happens during passages that I’m struggling with technically. So, the passages that I’m more scared of, like, I must be tensing up somewhere. I don’t know where.

Discomfort caused by unwarranted tension was mistakenly accepted as appropriate by Malika: “But, obviously, the whole support and muscle tension sometimes is a little uncomfortable but it kind of has to be.”

MPA was identified as a major cause of elevated and unpleasant physical tension. Jolene reflected, “It was mortifying. It was so scary I couldn’t ... I could feel like my whole right side tensing up.” Excessive tension and MPA resulted in loss of control and further fear. Thorough preparation alleviated tension in Dorothy as it reduced her nervousness.

Many students experienced an increase in muscle tension during performances. Jayden commented, “Like whenever I go on stage, there’s always tension that I realise there on stage rather than in the practice room.” In contrast, Khanyi described increased tension during practice due to being “more focused on yourself in practice”. Dorothy, who did the AT, experienced improved awareness and, as a result, experienced a pleasant reduction in tension levels.

After the course, 10 of the participants reported having learned how to identify excess tension and ways of dealing with it, as Frank remarked: “To know what to do when you’re feeling tense.” Seven participants described BMg as beneficial in that regard as it helped them to understand the structure, movement and interconnectedness of the body. Appropriate exertion or effort requires proprioceptive monitoring and tension awareness. In this regard, the students were empowered in a variety of ways, with the common factor being a newfound confidence as a result of having both security and freedom in their playing or singing.

Malika experienced more refined tension awareness than she had previously. She specifically explored how much tension is appropriate and where, thus developing her ability to monitor muscular exertion. Willem highlighted “not trying too hard” as important for him in reducing unnecessary tension, while Jayden referred to awareness of breathing as central to feeling freer. Frank felt that constructive rest had been most helpful in alleviating unwanted tension. Four students spoke about utilising a more balanced postural awareness without rigidity and stiffness. Max explained it as follows:

> I used to fight with the bass, you know. I never had that freeness in my arms just to, just to be loose and free. I just used to shout, shouting on a bass, you know, just fighting with the bass, not smooth you know, just relaxing my whole body because when your whole body is relaxed, everything just comes out freely; you don’t have to even force it.

Two of the participants found that being aware of their sound, expression and surrounding environment eased tension, as Jolene remarked, “…I wasn’t like holding on so tight.” Mandla described learning to be aware of tension in his whole body, not

only in his arms, which had been his focus due to their ongoing pain. His new consciousness of tension extended to his physical exercise and he felt able to "make better physical decisions" as he used to ignore the tension and push through it. His awareness of quality of movement and tension release led to a significant reduction in pain and discomfort, as well as increased enjoyment and musical freedom:

> I was using the way of precision versus the way that you were using the idea of quality of movement, one, to me the idea of precision was very tense and consistently very tense as opposed to the idea that you had, which was moments of tension and moments of release. So that kind of helped in a way that I could kind of work with the ebb and flow of the music by using a more relaxed state to kind of make the music more relaxed.

5.2.2.3 Postural and movement choices

Developing an awareness of appropriate postural and movement choices is integral to the multiple, ongoing and fluctuating requirements of musical performance. Prior to the course, posture was considered a challenge by seven of the participants and was described as a "struggle" (Mandla), "slacking" (Jayden), "stressed" (Mandla), "terrible" (Khanyi) and "tiring" (Jolene). All three of the violinists experienced postural discomfort while sitting during long orchestral rehearsals as Jolene illustrated: "I think, like, posture is a big one, especially in orchestra. I keep sliding back on my chair, it's just not ideal. And getting tired, you know, in long rehearsals and then you kind of, feel strain." I observed postural difficulties among the participants, including a rounded or collapsed shoulder region, anterior head-neck position, sway-back stance while standing, hyper-extended knees while standing or hyper-arched back (lumbar-lordosis) while sitting.

After the course, five orchestral players commented on how learning about better body balance while sitting had considerably reduced pain and discomfort. They felt more comfortable and perceived their playing as better. Bongi, a violinist, explained that learning about sitting balance had helped very much in playing in orchestra as she was no longer experiencing pain or, if she had some discomfort, she knew how to investigate it and figure out the cause: "…I definitely think knowing all the uhm [sic] what you gave me for sitting and also making sure I'm comfortable, I haven't had

problems like I did in the first semester."

Postural choices could then also be made in everyday activities with the transfer of skills. For example, three students also applied improved sitting balance when working at the computer. Four spoke about knowing about the spine as the central core being very helpful. The concept of finding balance rather than focusing on a static postural ideal such as being "bolt upright" made an impression on three of the students, as Khanyi illustrated: "Being aware of my posture but not, not like a stand- up-straight, soldier military sort of way."

Four of the students highlighted their enjoyment of learning about postural balance and the interaction with breathing. As a singer, Malika observed that being aware of head balance at the atlanto-occipital (AO) joint "relieves everything" and made her feel more centred. The sheer delight she experienced as a result of the ensuing vocal ease was visible and the immediate release was audible in her tonal clarity and resonance. Students experienced posture and balance as involving the whole body, and five mentioned being able to be aware of their legs and feet, as Wendy found: "So it was nice to like feel how they, like how they adjust to work on your balance and how your toes are helping you balance and all the muscles in your legs are moving."

An appreciation for quality of movement as part of posture was experienced by many students as helping with injury prevention. Movement awareness was expressed in different ways by five students, including the movements of rhythmic coordination, standing rather than sitting enabling freer playing movements, body movements being the integral source of the music, experiencing extraneous movements that hinder technique, and movement being a representation of the characterisation and mood.

In this way, an awareness of the synergy of musical and postural aspects emerged in the students, which was an exciting and inspiring development for all of us. The students were not only gaining knowledge with regard to injury prevention and health promotion, but were also acquiring skills for musical artistry, and the reciprocal benefits. Seven students became very interested in how the musical aspects relate to

movement and the body, and linking musical intentions to physical, movement and gesture awareness. Focusing on musical intention and characterisation supported movement and body awareness and "just let everything fall into place" (Malika). Mandla also described his new ability to move away from constant tension and over-emphasis on "precision", to responsiveness to quality of movement and grading his exertion more sensitively to link with musical expression.

5.2.2.4 Physical ease and freedom

The notion underpinning this theme is of a continuum ranging from musically disabling limitations as a result of discomfort, pain or injury to feeling enabled due to having physical ease and freedom. Pain caused the participants to feel emotionally distressed, deterred, despondent, worried, terrified and unable to cope.

Prior to the course, seven participants described their physical discomfort or injury. Willem spoke about a prior wrist fracture unrelated to playing, which had affected his playing and caused limitations. Two students had issues that regularly prevented normal playing. Frank had velopharyngeal insufficiency[76] (VPI) and Mandla had "repetitive strain injuries" (mostly arm and hand) and recurrent severe pain since the age of 15. He referred to pain as a "deterrent", and to ongoing physical discomfort and struggling "to develop a consistent posture for my playing". Both of these students were extremely distressed and emotional and found it difficult to talk about their limitations. I observed their psychological traumas as well as the fact that the injuries had had a profound effect on their sense of self. They expressed their concern, fear and despondency, as illustrated by Mandla:

> It makes me very despondent. It's actually quite difficult to talk about uhm [sic] because I'd really like a future playing the two instruments, but you know, when I'm sitting at a

[76] VPI is a condition in which the soft palate does not close, and air escapes through the nose whilst blowing through the mouth due to prolonged exposure to high intraoral pressure, manifesting mostly in oboe, bassoon, clarinet, trumpet and French horn players (Evans, Driscoll & Ackermann 2013:657)

> third-year level and I'm still having problems like this, and I'm supposedly... You know, I've got professional teachers. It kind of makes me very despondent for the future because it's very limiting. It's also, confidence wise, it's very limiting.

Frank described VPI in strongly emotive terms as "…*very* uncomfortable, and you just feel like you've reached the end of physical capability, which is kind of quite *terrifying*". After the course, Frank spoke about his VPI being somewhat better, although still a hindrance, but felt he was learning how to manage it. He wanted to explore the psychophysical link because he had observed that the VPI symptoms were aggravated by fatigue and stress. I noticed that he was developing his awareness and was personally motivated to begin the process of change required for rehabilitation.

I found the participants' experiences of pain alarming. Pain had been experienced as a serious limitation by five of the participants. Max reported, "…when I use my fingers too fast, they get really, really bad pains and I start focusing more on the pain than the music." Khanyi described her discomfort and tension: "I can't practise for long periods of time because I get, I start feeling very tense." Gabrielle, a singer, spoke about postural discomfort, with strain affecting her breathing, tone and pitch control. Two students described muscular pain (mostly in the back), which was severe enough to force them to stop playing from time to time.

Standing whilst playing was preferred by the upper string and wind instrumentalists as it enabled them to experience more freedom of movement and therefore felt more comfortable. The three violinists described physical discomfort related to sitting requirements in orchestral rehearsals, which were difficult and tiring. As Bongi noted, "Last Monday, in orchestra, I didn't think I would cope because it *[back and shoulders]* was really sore." Wendy's experience was that total rest solved an isolated incident of severe hand pain, whereas another student described tendonitis in her shoulder that took very long to heal as she did not rest it sufficiently.

My observations and the students' accounts of their experiences after the course were consistent, in that physical ease and freedom predominated, which facilitated improvements in technique, musicality, enjoyment, confidence, posture and stamina.

Eight students experienced having more physical ease and freedom as a result of factors, such as reduced physical tension, more awareness of posture and body use, having tools for dealing with discomfort and challenges, and breathing awareness. Mandla commented on his significant reduction in both discomfort and pain, which resulted in improvement in technical level, stamina and enjoyment:

> Yes, I remember when I started the course I was getting problems with the top of my back. That was something that I actually worried about coming back, you know, recurring, and I feel like the mapping of the arms into the back may have helped with that quite a bit. As well as the acknowledgment of the support, like it kind of made me feel I was much more sturdy when I played. ... now I have gone up to three to five hours.

The concept that improved body awareness and use supports technical needs was understood by several students. They found that using musical intention was a good starting point for accessing the appropriate physical awareness to develop technique. Frank mentioned how his physical ease had helped his technique which, in turn, supported the performance and expressive aspects: "…so I can feel that I've improved in that way, like the physical aspect, and it's kind of transferred into like just more natural technique and therefore I feel like I can express better which is nice."

Similarly, Dorothy emphasised that thinking about the musical intention and expression as a starting point rather than focusing on technique first was very helpful in terms of her physical comfort: "Ja [sic], I feel much more comfortable. Much more able to approach the physical-technical side … it makes such a difference and your stamina is much more and you can do stuff for much longer."

Once again, I noticed the synergy between physical ease, musical interpretation and technique. The participants were highly motivated by their independent capacity for effecting change, making discoveries and finding their preferred ways of attending to their own needs, thus building an inner confidence, determination and resilience.

5.2.2.5 Allowing myself to breathe

This theme reflects the participants' understanding of their breathing awareness. It evolved from perceptions of control and restriction to perceptions of allowing and flow. I observed how much their experiences of breathing interlinked with posture, tension, anxiety, technique and musicality.

Prior to the course, two wind players, two singers and one violinist expressed a desire to enhance breathing awareness, while both singers identified breath "control" as a "focus" (Malika) and an "issue" (Gabrielle). Wendy, one of the wind players, experienced restricted breathing due to tension and nerves: "I don't breathe as well as I should when I'm nervous", whereas the other, Frank, enjoyed a particular programme of specialised breathing exercises. Jayden, a violinist, felt that improving his breathing awareness would support his playing in many ways.

After the course, it was interesting to note that many of the students had found the practical sessions on breathing, including breathing awareness activities, useful and "quite eye-opening". They enjoyed learning about the movements of breathing and their interactions with whole-body and postural awareness. Malika was of the opinion that learning about freer breathing "just made everything flow a lot easier". Wendy, the oboist, experienced feeling less stressed about her breathing and "like I just need to get used to just allowing myself to breathe". Both singers found that their attention to breathing and posture as the basic foundations, instead of focusing on problem areas, was very helpful as the problem area "fixed itself" (Malika and Gabrielle).

It was notable that the non-wind instrumentalists spoke about the importance of breath for them, as Jayden commented: "…just making sure you breathe before, especially before you play." An awareness of breathing was highlighted as important for sound, phrasing and the release of tension: "Breathing is such a big one that I just completely underestimated before" (Jolene). Seven students also experienced breathing awareness as beneficial because it "calms you down" (Gabrielle). Many had enjoyed the constructive rest sessions during which breathing awareness for kinaesthetic

awareness, mindfulness and relaxation was practised.

Breathing awareness and understanding expanded to become a pivotal aptitude, enabling attentiveness to bodily feeling within psychological, physical and musical lived experience.

5.2.2.6 Auditory, kinaesthetic and spatial integration

After the course, experiences of spatial and sensory inclusivity emerged. These developed from the participants' initial disconnected sensory and spatial perception evidenced in their interviews prior to the course. The significant integration of the auditory, kinaesthetic/proprioceptive and spatial awareness is the dominant feature of this theme.

Before the course, when discussing auditory awareness, the students mostly described musical listening awareness skills, such as intonation and ensemble playing. I observed that listening was perceived as an isolated music-related skill. Yet musical listening was also a welcome distraction for Mandla, who found that the quality and colour of the sound as his focus, helped to take his mind off his physical discomfort and pain: "Timbre, the timbre. Ja [sic], they allow me to forget about my inability to be comfortable physically when I play." Diminished listening ability was reported by Wendy who explained her challenging experience of focusing too much on technique, resulting in a reduced ability to listen to the sound: "So, I mean, I find it hard to know what I sound like." A narrow, yet multisensory perception of tactile, kinaesthetic and auditory acuity was described Frank, one of the wind players, who described the sensory combination of the sound and the feeling of the reed in the mouth.

Two of the participants reported that the spatial aspect of relating to the surrounding space and environment was hardly discussed although it was experienced in terms of a potentially challenging relationship with the audience. Mandla felt that he had not tried to communicate with the audience as "it's way above my level". Yet he described his enjoyment of "performer-performer" interaction. Frank observed that he usually

plays better in a concert compared to in an exam because of the communication and interaction with the audience, which is not as easily achieved in more evaluative situations.

After the course, five students spoke about exploring the concept of listening to their sound in the whole space and playing environment, the importance of tone and the significance of how one listens. I observed how their listening consciously became broader and linked to their body and spatial awareness. This exploration of listening as an integrated sensory and kinaesthetic experience was exemplified by Malika: “Ja [sic], just the perspective of the how to listen with your entire body and just focusing on your whole body at once rather than little portions of it was really interesting.”

Discovering the ability to become aware of the surrounding space had several benefits, such as letting go, opening up, building confidence, hearing better and relating to the audience. Bongi spoke about being more aware of “actually listening” to what she was playing in that moment and being able to “open up”. She continues:

> … connecting with the audience and exaggerating a lot and kind of just opening up. Definitely changed ... It’s more enjoyable … playing … for everything, for surroundings. And trying to like connect; it’s kind of a challenge but it’s much more enjoyable than just playing … the notes or the dynamics ... trying to connect with the people.

Similarly, Willem experienced a broader spatial perspective and more integrated awareness as a positive enhancement, alleviating his internal stress and tendency to focus on “what’s going wrong” during performance: “… it completely also changes how I am able to enjoy it.”

This broader, more inclusive awareness facilitated being present mentally, physically and musically. I observed a total immersion in the task, yet an open relatedness to the environment. Sensory inclusivity, integrating auditory, kinaesthetic and spatial responsiveness may therefore be a key element of establishing a state of flow.

5.2.3 Psychological Awareness

The psychological attributes and behavioural experiences emerging from the interviews comprise this theme. There are four subordinate themes:

i. Attitudes;
ii. Self-evaluation capacity and constructive acceptance;
iii. Performance anxiety: debilitative and facilitative; and
iv. Performance confidence and enjoyment.

5.2.3.1 Attitudes

This theme became somewhat more idiographic in its representation due to greater individual nuance and less collective patterning. The name of the theme is therefore more descriptive to enable inclusion of the range of perceived attitudes, such as dissatisfied, unhappy, despondent, self-critical, destructive, distracted, external locus of control, acceptance, perseverance, patient, logical, motivated by challenge and inspired.

Before the course, the way in which the students related psychologically to their performance and practice was highly individualised. Frank and Mandla were very dissatisfied with their playing as they felt hampered by the pain or limitation of recurrent injury, and both described their very real fear, concern and frustration. Frank was able to maintain a broader perspective at times, but Mandla was extremely despondent: “I’m told that I can actually ... that I am technically quite adept, but I don’t feel like it because of my discomfort when playing. It hurts, generally, for me to play, especially in my thumb.” Mandla also felt a disjuncture between his “personal issues” and performance mindset that had to be “created” as a result of feeling deeply despondent and limited, and lacking confidence due to the recurring pain and injury. Fear of failure and physical pain, and not being able to trust the body to deliver caused ongoing emotional distress and trauma.

A highly self-critical attitude, coupled with self-doubt and destructive thoughts and beliefs, was experienced by Gabrielle and Jolene, who felt ‘overwhelmed’, dissatisfied and had negative perceptions of their ability. Gabrielle stated, “But most of the time, it’s just me telling myself that I’ve done everything wrong.” Jolene also spoke about experiencing highly self-critical, negative and over-analytical thoughts during both practice and performance. She experienced performances as extremely emotionally stressful. Variable concentration and frequent distraction during performance as a result of over-analytical thoughts was described by Wendy. An external locus of control was evident in Malika’s and Frank’s accounts of elevated examination stress, concern over marks and needing to “impress” the examiners. A tendency towards low self-esteem and self-sabotage, with negative, polarised judgments, lay beneath many of these perceptions.

Eight of the students mentioned their ability to engage in some pragmatic ways of thinking and utilise varying proactive behaviours to overcome challenges. I detected their underlying ability to separate self-worth and identity from their performance level.

Thorough preparation and musical inspiration enabled Dorothy to focus: “If I am prepared and I can think ahead so that I know I'm not going to make a mistake, then it's the nicest feeling ever. It's like you feel completely in control.” Bongi experienced perseverance and acceptance along with focusing on enjoyment. She described how she sometimes feels she is not good enough compared to her peers, but when hearing others, she realises, “Oh, I’m actually not so bad after all”, which restores her positive attitude. Malika displayed satisfaction with her potential and was patient and logical: “I’d say I’m on the right track.” Jayden, Wendy and Khanyi described having developed much higher self-expectations at university, which challenged their perceptions of their skills level and potential. However, they were motivated by the challenge as all three wanted to utilise this attitude to ensure progress. Jayden was therefore conscious of his need for reducing his over-thinking and having a committed and invested mental attitude during performance, which gets “the quality out when you need it”. Max explained that despite the pressure of performing, he had experienced it as having a positive influence on his confidence and self-esteem: “I’m having fun.”

5.2.3.2 Self-evaluation capacity and constructive acceptance

After the course, almost all of the students generally commented on having learned how to be more constructive in terms of their attitude towards themselves, especially when practising, therefore becoming more productive. Gabrielle illustrated her perception of this aspect: “I've learnt to listen to myself and be critical but not in a bad way”.

It was significant that self-acceptance, having realistic expectations and the value of experimentation were commonly experienced. Eight of the students learned to accept their own ‘issues’ and were developing constructive ways of dealing with them. They spoke about acceptance of their present level, enjoying it and avoiding comparison, as Bongi illustrated: “I think like just trying to be what you are … just doing my best I can do with what I have at the moment.”

Max found that the group learning and master classes were what enabled him to develop both self-acceptance, motivation to solve problems and resilience:

> It’s ok to be you know, to be *you*. You won’t be able to do anything and everything at any time you know. Sometimes you will struggle with something, but you will get it sometime, so don’t be hard on yourself. I know you cannot do this now but just go back to the practice room, do it and you will get through it, yeah [sic].

The master classes, in particular, made an impression on both Max and Gabrielle. Max commented on seeing the emotional vulnerability of those who were dealing with challenges, which helped him to develop compassion for others and himself: “It’s okay to be human after all.” Gabrielle, a singer, was able to develop her ability to be more engaged in performance communication, characterisation and expression. This was a positive area of learning for her as she had tended to separate practice and performance. She had been very reluctant to be emotive and expressive in performance beforehand as she had felt “very exposed and vulnerable”.

Dorothy felt that she could be more objective and is “not worrying so much about being

perfect and experimenting more than just trying to be right all the time". She described how it had become more about improving and working towards finding personal fulfilment: "I have changed my views on the psychology of it … it's about just getting better all the time rather than trying to do it correctly, to experiment … and that just makes me more confident because I am not so worried about failing."

Frank felt that he had learned a great deal about himself and how to monitor his own progress. He felt satisfied with his playing but noticed his strong self-critical tendency and wanted to continue to explore the psychological aspects thereof. Jolene described the development of her independence musically and personally as an interesting "parallel event" in which she had become more assertive in her musical expression and gained confidence to think for herself. Wendy noticed that her attitude was "less prescriptive" as she had become more proactive in her practice. In addition, she was more intrinsically motivated, "less fixated on results" and paced herself better.

A remarkable change was that eight of the students reported feeling empowered, taking responsibility and developing independent learning skills. Max commented on having acquired the skills to assess himself better: "So, yeah [sic], now I know my way ..." Khanyi also described a more constructive attitude in that she had learned to pace herself, became less frustrated, remained aware of how she was practising and felt better able to realise her own potential. She described feeling more confident about her level and being more patient with herself as far as overcoming technical challenges were concerned. Malika, one of the singers, commented on how she experienced being able to manage her work and progress better with improved bodily and musical awareness because "looking at everything in a new light was just refreshing". Willem, the percussionist, experienced letting go and achieving acceptance as essential as this balanced his negative, self-critical tendency with regard to his self-awareness: "I feel psychologically stronger, more prepared for anything because I'm just more content with my current state of abilities and everything."

Jolene stated how her attitude towards her technical abilities had changed in that "having like a clear musical vision has forced me to work on technical aspects in a

different way, you know. To work on them rather as enablers for that vision, rather than for its own sake so it's been a very different like experience of technical work". She felt more assertive and confident in her musical expression, less "obsessed with being right" and more accepting. Furthermore, she reported having realistic expectations and managing her internal critical voice.

Regarding the journals he kept, Mandla explained how the self-evaluation developed his "ability to look at [him]self in a more constructive sense" as he had to "sit there and acknowledge things that [he] was doing". In addition, he described his very challenging mental shift when he understood that there were no instant solutions, but that it would be a process, which necessitated a tremendous change in terms of his attitude towards his playing and healing. He described learning new skills pertaining to constructive self-evaluation and discovery as he had to acknowledge what he was doing and make choices, thereby improving his ability as an independent learner. He expressed his happiness and satisfaction: "I'm quite happy with my technical ability because of the fact that I have managed to play quite difficult repertoire … without so much pain."

I recognised that the underlying understanding among all of the students was the value of being more process-oriented, resulting in less fear of failure and far more satisfying outcomes. This was reflected in realistic self-acceptance and more appropriate goals and expectations. Fundamental self-directed behaviours that support effective learning and positive attitudes with regard to development, such as self-evaluation, monitoring, reflection, resilience and problem-solving skills, emerged.

5.2.3.3 Performance anxiety: debilitative and facilitative

This theme represents the participants' experiences of performance anxiety before the course, including both debilitative and facilitative features. It is essential to be cognisant of the fact that elevated arousal may be highly facilitative in supporting optimal performance, yet certain types and levels of arousal may be a severe hindrance or even incapacitating for performance. I therefore recognised the intimate

interplay between the cognitive and physiological characteristics. On a simple level the MPA itself manifested in the form of physical and psychological symptoms. A similarly direct interaction occurred with regard to causality: it appeared as though emotional and mental factors were at the source or, conversely, that muscular pain and limitations had initiated the MPA. Yet upon further investigation, the rather messy entanglement of mental and physical factors became a complex cycle, which continuously reinforced its own destructive proliferation. This non-linear, multidirectional and multidimensional perspective was complex and fascinating.

This coupling of mental and physical aspects was evident from several participants' narratives as follows: Gabrielle described her disembodied MPA experience as "blanked-out", disconnected, and expressionless. She further stated, "I get really scared and anxious. And then I just sort of have a blank expression." Mandla's MPA was linked to his severe muscular pain and discomfort caused by playing. He suffered a loss of confidence in performance due to lack of self-trust, loss of technical control, tension, stress and fear due to physical pain and limitation. Frank found that his levels of anxiety were more challenging in evaluative performances, which caused excess muscular tension that worsened his VPI. Severe debilitating MPA was experienced by Jolene with the manifestation of both physiological and cognitive symptoms. She explained, "… if I'm very nervous, which happens like 99% of the time. I tense up a lot." She experiences self-consciousness, fear, trembling and loss of control. She described feeling very frustrated and her efforts to regain control, such as detailed planning and preparation, tend to be negative and stifling. She had tried visualisation, but this was not useful and she did not have any other strategies. Three other students also did not have any strategies for performance confidence.

Nine of the students had tried various approaches, the most common ones being behavioural, such as performance exposure and good preparation. Some cognitive strategies were touched on, such as enjoyment instead of comparison, audience support, positive thinking, self-acceptance, acknowledgement of own abilities, developing resilience and less emphasis on perfection. It was interesting that the body-related strategies described were far fewer and less specific, such as breathing,

stretching, body awareness and closed eyes. One student explained that she did not like the way she had felt when using beta-blockers and was therefore focusing on acclimatising to audiences. A curious matter was that none of the other students had mentioned beta-blockers or any other type of medication. This is thought-provoking considering the likelihood of beta-blocker use as frequently demonstrated in the literature.

Facilitative arousal was experienced by four students, who enjoyed the excitement and adrenalin of performance. They described their nervousness, yet were able to focus on enjoyment together with trusting preparation, acceptance, letting go and becoming accustomed through regular performance. Khanyi asserted, "… sort of get a kick out of playing in front of people; sort of that adrenalin rush, which is quite, I quite enjoy now.' Wendy and Frank described experiencing moderate nervousness, which they did not perceive as MPA, with predominantly physical symptoms that are effectively reduced through body awareness and breathing. Jayden was conscious of over-confidence causing reduced concentration and accuracy: "Often the worst experiences I've had is because I was almost too confident when I shouldn't be and I don't know everything well enough."

The participants were articulate in expressing the diverse facets of their performance anxiety perceptions and understandings, including some strategies for confident performance. This laid a receptive and fertile ground for learning more about this topic during the course. Overall, despite lacking in determined performance psychology competencies, they were highly motivated, open, familiar with the territory and ready to explore the area and acquire skills.

5.2.3.4 Performance confidence and enjoyment

Ten of the students perceived themselves as being more confident performers as a result of participating in the course as they felt they had gained helpful performance psychology strategies and their attitudes and behaviours had changed. Six students described experiencing more enjoyment in performance. In general, enjoyment of

playing and a positive attitude were stimulated by the course. Dorothy summed it up as follows:

> The course contributed to more enjoyment of playing because it wasn't compulsory and everyone wanted to be there, and it just made such a difference from the normal environment that I often find here at *[…]* where everyone is stressed and not really enjoying the music...

This theme reflects the pervasive performance confidence and enjoyment that emerged. The theme is presented as mini-vignettes of all 12 participants, each individually encapsulating the theme, thus enabling my richer understanding. I chose to highlight this idiographic representation, including all the participants, because the unique life world of each student was so distinct and individually nuanced, and offered wonderful insight into their particular perceptions.

Mandla enjoyed his playing more because he had less tension overall, less pain, less discomfort, more comfortable playing and more stamina. He therefore had reduced anxiety and stress because this had been linked to the recurrent playing-related pain. Due to the pain reduction, he experienced better well-being and improved performance confidence. A sense of mastery and efficacy overcame the despondency and diminished self-trust, which had been driven by the fear of pain.

Khanyi described feeling much more confident and "…some of the performances I have done since the course just being more aware of myself and the audience and to just trust in yourself that you have done enough and just sort of let go and play". The course gave her performance confidence tools and she felt that "having the space to, during the lectures, to talk about it and hearing other people's experiences" was also helpful. I felt that she had given herself permission to trust her preparation, which enabled her to let go.

Singing, with more emphasis on characterisation, embodiment and musical intention was much more enjoyable for Malika: "I wasn't nervous at all, actually, normally like my knees shake; that was perfectly fine and just everything felt more natural and easy."

She describes her rapport with the audience as being very encouraging for her. Knowing what to do with the music was translated into an embodied musical intention, which freed her completely.

Jolene, who had debilitating MPA, which she worked through during the course, felt that her confidence had improved significantly and that she now had strategies for performance confidence. I sensed her compelling determination to be herself and achieve what was meaningful for her. This was what I believe supported her deep personal engagement with the immensely challenging process. She perceived the integration of the cognitive and physical experiences as having been the most helpful to her. She realised that she had been putting pressure on herself and described a more constructive practising approach, which would help her to become better at managing her internal critical voice: “I have become much better at reviewing myself in a kinder way.” She devised her own slow warm-up strategy comprising slow playing, mental rehearsal and awareness, which enabled mental clarity, far less tension and almost no trembling during performance. Realistic expectations, acceptance, whole-body awareness, breathing and focusing on musical intention and expressive aspects together with technical factors were all significant for her. She felt more independent and assertive in both her musical and personal expression as she moved away from “trying to be right” to thinking for herself:

> It was a very emotional course for me and I didn’t expect that. ... but I think working on all of those required like a very personal engagement and a lot of it was really exhausting, uhm [sic], but I feel like I did work through a lot of things and broke a lot of barriers that I was unable to even chip before.

Wendy mentioned that her shift in attitude and reducing her focus on perfection had been significantly beneficial in that “you can play music and have fun with it even if you don’t play all the notes right”. I recognised her improved ability to manage her self-critique, discover her real joy with regard to music-making and even her sense of humour. She explored using much more expression in her playing, thinking less about technique and more about the music, being less prescriptive and more flamboyant, and aiming to be a confident enough performer so as not to be worrying about a few

little mistakes. She therefore experienced a new focus on the enjoyment of performing rather than being driven by an extrinsic focus on marks:

> I feel like I can enjoy music more without worrying about it being right. I don't know if that really counts as confidence, uhm [sic], but I think it does. Like to, to be, to not take yourself so seriously as a musician. Like actually it's not the end of the world if something goes wrong or if you play a wrong note.

Dorothy felt that she had understood the psychology behind performance anxiety better than she had before the course. She explains:

> For me, it's just looking at everybody else and how they see fulfilment, especially the good people and how almost everyone, even if they are good, thinks that they are bad and then you realise that no one is really being objective about it.

She was conscious of being more "objective" and felt more confident "because I am not so worried about failing". As she began to understand that "almost everyone" is self-critical, she no longer felt as trapped by her own self-critical voice, which allowed her to see fulfilment far more "objectively" and realistically, yet also very personally.

Frank noticed that he had felt the most comfortable when he really believed in the music that he was playing and was deeply engaged in it. He described experiencing some nerves for solo performances and felt that he was often still quite self-critical, which was something he was becoming more attentive to. His emotive connection to music, which was profoundly meaningful for Frank, facilitated his positive mindset.

Willem felt confident and accepting of where he was. He determined that for him, the most important aspect was not to compare himself to others although he benefited from having goals and challenging himself. I perceived that his purposeful self-acceptance was integral to his being more assertive in presenting himself.

Gabrielle felt much more confident and comfortable when performing as she was now able to practise constructively. She commented on learning to integrate practice and performance, and was able to connect to the musical expression and communication. Effective practising competency was crucial for Gabrielle as her lack of practice skills

had repeatedly resulted in performances that she perceived as failures, reinforcing her feelings of inadequacy.

Bongi described how she had enjoyed performing more as she could be in the moment of the performance rather than “trying to get it over with”. She now consciously accepted doing her best with what she had at that moment, and particularly enjoyed the sharing of ideas in the class on performance psychology. She felt able to let go, not worry about technique and open up more (musically and physically) in performance, which resulted in sensing more support from the audience. I found it significant that she had identified her positive relationship with a performance environment, psychologically, physically and musically.

Jayden described an improved breathing awareness. He found that it was very important for him in terms of performance confidence, especially before he played. What was happening was that his consciousness of quality of breathing reinforced his capacity to be mentally and physically present.

Max spoke about how seeing the challenges that others in the class were dealing with had helped him tremendously. He also commented on the value of relating to the audience and regular performance exposure. As he accepted his strengths and challenges, I sensed his deepened sense of compassion for himself and others.

5.2.4 Musicianship

Musicianship as a super-ordinate theme reflected the students’ perceptions related to practising experiences, and musical artistry and embodiment. There are four subordinate themes.

i. Inconsistent practice;
ii. Productive practice;
iii. Musical disembodiment; and
iv. Musical embodiment.

5.2.4.1 Inconsistent practice

This theme offered a collage of the students' varied and, in most cases, inconsistent approaches, behaviours and experiences associated with practice prior to the course. The challenges faced during practice were quite individualised. All of the students spoke about taking breaks during practice and knew about pacing themselves. However, it was unclear as to whether they had implemented what they had described. I became aware that the multifaceted and significant role of practice was not fully understood by the students and that they would benefit from developing more advanced practising competencies.

Four of the students mentioned that they had continued practising when very "involved" and then lost track of time, as Mandla asserted: "I tend to over practise. I tend to get very absorbed in what I'm doing and get very distracted." In a similar way, Malika perceived technical practice as "manipulating the body", "unnatural" and "a lot of work", describing her understanding of the combination of technical and interpretative aspects. I realised that these students would benefit from improved self-regulation and self-evaluation skills together with better kinaesthetic awareness to monitor their exertion levels and interaction with musical aspects.

Jolene and Khanyi described feeling extremely tired after practice. This was depicted by Jolene as: "Tired. Really, really drained like mentally and physically." Khanyi found that she often needed to cut practice sessions short because "… I feel very tense, uhm [sic] like knotted up…". Frank highlighted the ensemble and orchestral rehearsals in addition to personal practice, which added up to a very heavy playing load. However, Jayden spoke about smaller chamber ensemble rehearsals being more energising and being more musically inspired. Therefore, he was able to continue for much longer without a break. These perceptions raise issues of stamina, pacing, appropriate exertion, tension, positive mindset and musical fulfilment as interactive factors in practising efficiency.

A pessimistic, defeated and emotionally upsetting view of practice underlined Gabrielle's and Jolene's narratives in which they seemed to be crying out for solutions and strategies. Gabrielle, who was often negative and self-critical, had variable and complex attitudes to her practice and experienced many "struggles": "Because I know I can do it, but there's just something ... standing in between me and doing it." Jolene experienced technical challenges in practice as "emotional" and "upsetting", while she seemed to experience less pressure with regard to repertoire because "… the grey nature of interpretation takes off the pressure of wanting to be right". She elucidated:

> But often, if I make a mistake, especially after like a long session or a long time trying to fix something ... I go back to "I'm not good enough; this is never going to work". It sounds ridiculous when you tell other people about it, but I really feel like completely overwhelmed ... uhm [sic] ... a lot of the time in my practice sessions. Even with like technical things which like you shouldn't get emotional over technical aspects, you know, just fix it, kind of. But I get *really, really* upset.

Two of the students emphasised that they had not felt efficient in practice at all, yet enjoyable and creative practice was experienced by five students, with proactive, self-directed and independent learning behaviours. Bongi remarked, "It's kind of become my friend." However, Bongi also explained that she did not enjoy rehearsing for orchestra because of her pain and discomfort: "… that's why I don't really enjoy orchestra that much ... I always have a thought in my mind about pain. Uhm [sic]... so I guess it doesn't help me to practise." It is interesting to note that this reveals the demoralising and demotivating impact of pain, which is frequently not spoken about.

Malika was very pragmatic and positive about practice: "So normally, if I feel like I've learnt something or progressed in a way, I normally feel very, very good about that." This was indicative of sensible reflection, monitoring and self-evaluation. Helpful mental practice methods were utilised by two of the students, as portrayed by Max: "I don't even touch the bass. I just look at it and think. I don't do anything. Okay, that's achieving something. You're just sitting down and you're thinking about fingerings, music, chord progressions." I found it interesting that most of the participants did not mention mental practice at all, suggesting that they were not aware of it.

An interest in the interdependence of technical development and expression and interpretation was described by three senior students, who explained that this had impacted on their choice of practice strategies. I observed that this more developed attitude to practice was possible based on more musical maturity. Frank made a remark about feeling productive in practice and using several techniques, including slower methods, body awareness and listening. Dorothy described her quality of attention, focus and inspiration during practice as integral to efficiency along with needing specific goals. In general, the more senior students, fourth-year and older, felt more satisfied with their practising. They were able to self-reflect on their approaches, as illustrated by Jayden: "… some days very depressing, some days very relieved that you practised, and some days even like excited. Like, ja [sic], very excited afterwards and you want to do more." He explained that there was not enough time to do everything that had to be done, but wanted to develop a more structured approach in order to be more efficient.

5.2.4.2 Productive practice

Effective and productive practice strategies are significant as musicians spend more time in a practice environment compared to performance situations. It appeared that the students really wanted to learn better practice methods. What emerged as a new discovery for most of them was that practising requires continuous planning, monitoring and musical, physical and psychological engagement. I sensed that the students were integrating into practice the material they had been learning in other areas of the course, for example, BMg concepts and postural corrections. Almost all of the participants described having learnt helpful practice methods and many perceived practice as more efficient, enjoyable and less emotionally and physically stressful. Khanyi expressed her view as follows:

> … the emotional stress with the practising, yeah, like I often used to guilt trip myself if I didn't feel like I was practising enough so I guess just knowing that you can still be constructive, but not having, doing this exorbitant amount of hours a day. Physical stress definitely with, I guess, just being more aware of how you're practising so you can have slightly longer practice session because you're not tensing up or getting frustrated.

The class on practising was perceived as beneficial by 10 of the participants, who commented on having learnt a variety of useful approaches to practising. For seven of the students, body, movement and posture awareness had become a part of efficient practice. Having clear musical intentions, which integrate technical, musical and physical awareness aspects in practice, became an effective tool in practice for five of the participants. Four of the students described the value of measuring practice not only in time but also in terms of how constructive it was. Mental practice skills were adopted by four of the participants. Wendy described how she had started using mental practice and had found it more effective than she initially thought.

Three of the students perceived their new awareness of using more mindful repetition characterised by awareness, evaluation and corrections as being more helpful than mindless, obsessive, mechanical and repetitive playing. Other useful practice approaches that had been adopted were a more structured approach to practising; really listening; shorter and more frequent sessions; taking breaks; a slower, more thorough approach to warm-ups, with awareness, listening and mental preparation; and connecting practice and performance. Jolene expressed that “working on translating practice into performance, yeah [sic], it was really an interesting kind of field that I wasn’t completely aware of and also really, really helpful”.

Practising was experienced as more enjoyable by five of the students as a result of their more constructive and proactive approaches. Practice sessions were perceived as more efficient and less frustrating as exemplified by Jolene: “I am getting much better at not practising through things when I’m really frustrated and I find that I learn things much faster actually as well that way.” Similarly, the experience of utilising evaluative skills and positive psychology was described by Gabrielle. A constructive practice approach with awareness and independent thinking was the biggest change for her. She was able to practise far more productively than she had done previously. She summed it up as follows:

> I thought for me, it was like the more I sing the song, the better it will become. I didn’t think that the more I sing the song and not fix anything in the song, it won’t become better; I'm just practising my mistakes basically all over and over again. So that was an eye opener, definitely.

5.2.4.3 Musical disembodiment

The theme of musical disembodiment encapsulated the participants' perceptions of a lack of a bodily connection with their music-making, expression and artistry. It did not apply to all of the participants but revealed several critical perceptions and understandings of either musical disembodiment or a longing for more embodied musical artistry. I observed this musical disembodiment in some of the master class performances at the beginning of the course. Aspects that were noticeable were lack of musical communication, performance anxiety, poor stage presence, and physical and musical rigidity.

Four of the participants described an experience of absolute disconnectedness from their music-making before the course. It seemed to function as a limitation and an obstacle to authentic artistry in performance. Mandla could not "embody that persona" and explained his disconnectedness: "To me, I think it's one of my biggest hurdles is actually being able to create a mindset and step into a mindset to be able to properly express a certain genre of music." I sensed that his pain and MPA caused him enormous inner conflict that he could not resolve.

Gabrielle felt that embodiment and expression were important but perceived her inability "to make the music come alive in my body and my face", and Khanyi felt that she had not thought about it much before: "I don't feel like I'm at the point where I feel like I'm an individual performer yet, I guess." Jolene experienced such stress during performance that she could not get to the point of being "lost" in the music or even "experiencing it really". I realised that these musicians were not conceiving of themselves as artists at all. Artistry seemed to be a future notion or, perhaps, in their view, was reserved for very few elite performers.

Prior to the course, eight of the participants described their sense of physical, emotive and expressive connection with the music in a variety of ways. However, these were mostly conveyed as concepts, aspirations and ideals rather than a current experience.

I observed how important these notions were for the participants yet felt that this was a cognitive knowing and sensed a yearning for more embodied musical experiencing as musicians. Dorothy illustrates this: “It's like, I don't know, you could say you become one with the instrument. Uhm ... ja [sic], it’s just like, it just feels right.”

Bongi and Jayden described musical embodiment as feeling deeply connected and drawn in, with total physical and emotional immersion in the music. Wendy felt that the concept of musical embodiment had had meaning for her in terms of the emotions she feels when playing and suggested “…being in the music while you’re playing it.” She felt that “it is an ideal that everybody strives for and I think it is important to be able to convey a character through your music”. The singer, Malika, also described musical and expressive embodiment as necessary for characterisation as a singer in that it is about exploring the depth, layers and subtleties of the character so that the audience can understand and feel it.

Willem’s perception was about embodying and internalising the stage persona authentically so that “every part of your whole body, your whole expression in that moment is that”. Max felt that musical embodiment and expression form part of the presentation in that it must be communicated through the body: “You have to be what you’re playing. If you’re playing something sad you ... even your movement will show that ... I think that is what makes music fun because you can just act it out.”

Frank explained that one of his aspirations as a musician is authentic expression in performance: “Taking what was created as a work of art and interpreting that as an individual, essentially. And to be able to do that completely freely and yet still respectful of what was going on, what we believe, I think, what was intended.” I sensed his strong aspiration to be an artist.

5.2.4.4 Musical embodiment

Musical embodiment was a theme that applied to all of the participants. Improved body consciousness enabled several students to feel more physically comfortable and musically expressive. Awareness of interpretative communication with the audience was the main aspect that supported some of the students' musical embodiment, whereas musical intention was the impetus behind musical embodiment in several other participants. It was apparent that fulfilling and engaging musical embodiment could be accessed through the body or the music, but that both had to be cohesively involved.

After the course, the connection between music and the body was experienced in terms of enhanced body awareness by Willem, Frank, Max and Mandla. Willem described the connection between the body and the music in that "the expression can't really come out until you're comfortable". Frank commented that having better body awareness allowed for a more "natural technique" so that he felt more expressive. Similarly, Max felt that whole-body awareness and being freer helped him with expression and musical embodiment "by making me aware of the whole me, the whole body, how my whole body should be part of my bass when I'm on stage". Mandla was also able to become more musically embodied as he adjusted to the concepts of whole-body awareness, quality of movement, and the "ebb and flow" of muscular and musical tension and release:

> … my mental approach to playing has differed in my understanding of what is required to kind of create what I want to create. Like the tension release and ebb and flow thing. Also, my mindset has changed whereby I don't particularly go for a more intense mindset to create a more intense feeling for the music so much because that makes me very tense and I cannot stick with it then.

Artistry, expression and communication were perceived in comparable ways by Khanyi, Jayden, Gabrielle and Bongi. Although Khanyi spoke about not being so interested in concepts such as artistry, she expressed how the course had awakened some curiosity in terms of her musical communication with the audience and the development of her expressive abilities as an artist. Jayden added that his challenge

was “… also in terms of expressing myself on stage, sometimes I feel a lot more connected sometimes, but … sometimes I feel like I don’t give it the full attention on purpose”. He was in touch with his fluctuating artistic energy levels.

Gabrielle had been gradually learning to develop her interpretive and expressive ability, which helped her to be connected to the experience and to the music although this was new to her and she had felt uncomfortable at first. She was pleased that “I was trying to like get to a point where I was comfortable doing, which is expressing emotion when I was singing”. Bongi explained how she had been developing the expressive and communication aspects of her playing during the course and how she had felt she could ‘open up’ more when she played, and noticed how the quality of movement really had affected her expression and sound.

Musical intention as the starting point was integral for Jolene, Malika and Dorothy. Jolene’s essential confidence-enabling strategy was to be aware of musical intention first and foremost. She found that having a good understanding of her musical plan went together with the technical and physical aspects of tension release and musical embodiment. Likewise, Malika felt more musically embodied, physically comfortable and vocally natural when she really knew her musical interpretation and characterisation. She was better able to convey the meaning in the text and create the appropriate emotion and sound. These were new discoveries for her.

Dorothy also really liked the concept of musical intention as a good starting point to access the appropriate physical awareness to help her feel more connected to her body and the music. She compared it to a language: “When you speak a language, if it’s your mother tongue, you understand how to use the words to produce the right emotion ...” She felt that she was gradually developing and trusting her own interpretative skills. She said, “I always felt like I didn’t understand my body enough to be able to transfer what I was trying to do. I always felt like I was separate from the piano if you like, but I’m beginning to feel more comfortable, more at home.” This sense of being “more at home” was reflected in many of the participants’ narratives. Musical embodiment and accepting an identity as an artist brought the musician home.

5.3 QUESTIONNAIRES

The data gathered from the pre-course background information questionnaire, the post-course music department course evaluation form, and the post-course questionnaire for teachers will be presented in this section. This data was collected as supporting descriptive and contextual information for the IPA study. The findings will be outlined and discussed below.

5.3.1 The Pre-Course Background Information Questionnaire

The background information questionnaire was completed by all 19 class members. However, only the data obtained from the study sample of 12 participants will be reported.

5.3.1.1 Findings

Please refer to Table 5-2 for an overview of the data:

Table 5-2: Data overview: pre-course background information questionnaire

PRACTICAL PERFORMANCE SKILL (INSTRUMENT, VOICE OR CONDUCTING)	Alto saxophone (1) Oboe (1) Clarinet (1) Double bass (1) Bass guitar (1) Piano (1) Voice (2) Violin (3) African percussion (1)
PRIOR EXPERIENCE OF SOMATIC METHODS	None (8) Rudimentary (4)
MUSIC PLAYING-RELATED INJURIES	No (3) Yes (9)
LIMITATIONS EXPERIENCED IN TECHNICAL SKILL AS A MUSICIAN	No (2) Yes (10)

PHYSICAL, MUSICAL OR PSYCHOLOGICAL ISSUE/S OF WHICH THE INSTRUCTOR SHOULD BE AWARE	Back pain (2) Scoliosis (1) Low self-esteem and anxiety (1) Anxiety (1) Severe muscular tension (1) Poor posture (1) Arm pain (1)
PERFORMANCE ANXIETY	Yes (7) No (1) No, only moderate nervousness (3)
REASONS FOR CHOOSING TO TAKE THE MOHC	Improving performance in general (4) Mental aspects of performance (4) Interesting (3) Body use and posture (3) Long-term solutions (2) Better practising techniques (1) Reduce physical tension (1) Better voice care (1)
PRIMARY GOALS FOR THE CLASS	Overcoming performance anxiety (4) Reducing tension (4) Injury prevention (3) Body awareness (3) Improving posture and breathing (2) Alleviating pain (2) Optimising performance (1) Improving technique (1) Repetitive strain injury management (1)

The first question asked which performance skill (instrument, voice or conducting) would be focused on. There was an alto saxophonist, an oboist, a clarinettist, a double bassist, a bass guitarist, a pianist, two sopranos, three violinists and an African percussionist, who also frequently sang whilst playing.

Regarding the question about their prior experience of somatic methods, eight of the students had no experience of any somatic approaches. Of the four students who had

some experience, which was mostly rudimentary, two had attended a prior BMg workshop with me and two had introductory AT experience.

In responding to the question “Have you ever suffered music playing-related injuries?” three of the students answered *no*. Of the nine students who answered *yes*, problems ranged from PRMD of the upper limb (wrist, hand, thumb, shoulder and forearm) (5); back problems (2); a palatal air leak; pain caused by tension; jaw problems; to pain and discomfort from long hours of orchestra rehearsals. Management and treatment included rest (1), physiotherapy (2), anti-inflammatory medication (2), antibiotics (1), neck strap (1), posture awareness (1), exercise (2) and osteopathy (1).

Two of the students answered *no* to the question “Have you ever experienced any limitations in your technical skills as a musician?” while 10 answered *yes*. Specific limitations were described with regard to breathing (2), general tension (2), lack of general technical ability (2), vocal control (1), finger agility (1), throat tension (1), ongoing pain (1), tone and projection (1) and fast articulation (1).

In referring to issues that were relevant to their participation in the course, two of the students described psychological concerns with regard to anxiety and low self-esteem. Physical tension, back pain and postural concerns were expressed by five of the students.

Seven students answered *yes* to the question “Have you ever suffered from performance anxiety?” and explained their various behavioural, cognitive and physiological symptoms of performance anxiety. One student did not answer the question. One student answered *no* to the question, whereas three who had also answered *no* explained that they had experienced and accepted slight nervousness as normal.

The students provided various reasons for choosing to attend the MOHC. Comments centred around it being interesting, enhancing body use and posture, improving performance, dealing with performance anxiety, enhancing musicianship, better

practising techniques, working on their mental attitude to performing, reducing tension and voice care. One student mentioned: “At first, I thought it involved teaching how to give massages so I signed up!” Two of the students mentioned the need for long-term solutions as exemplified by this comment: “I wanted to become more aware of how I use specific parts of my body when I play. And to learn how to identify problems and learn to create lasting solutions.”

In answering the question “What is your primary goal for this class?” the students described multiple aims. The singers mostly expressed a need for vocal and body integration as described by one student: “… to have my body and voice function more as one unit.” Other aspects that were mentioned included overcoming performance anxiety (4), reducing tension (4), injury prevention (3), body awareness (3), improving posture and breathing (2), alleviating ongoing pain (2), learning how to achieve optimal performance (1), overcoming psychological barriers and associated physical tension, overcoming throat tension and velopharyngeal stress insufficiency (VPI), improving technique, repetitive strain injury management and “to gain knowledge as to how I can become a better musician physically and psychologically”.

5.3.1.2 Summary and conclusion

The findings of this questionnaire corroborate similar descriptive data obtained during the pre-course semi-structured interviews. There was minimal to no prior experience of somatic approaches. Most of the students reported that they had experienced music playing-related injuries. Treatment and management was mostly self-reliant. Almost all of the students reported experiencing limitations in their technical skills as a musician. More than half of the students reported having experienced MPA. The students’ reported motivations and goals for the course echoed the results from the interview data. The questionnaire was also useful in that it provided contextual information which guided me in the choice of relevant lecture content, teaching strategies and students’ needs.

5.3.2 The Post-Course Music Department Course Evaluation Form

The music department's standard course evaluation form, which was completed by all of the class members during the final lecture, provided interesting descriptive information. Data from all 17 students who completed this anonymous evaluation are included as it was impossible to select only the 12 study participants' responses because they were unidentifiable.

5.3.2.1 Findings

The students chose '*strongly agree'* in response to the following statements:

- "The contents of the course are relevant to my development as a musician." (14);
- "My interest in the subject has grown as a result of this course." (12);
- "The lecturer is well-prepared." (14);
- "The lecture atmosphere was pleasant." (14); and
- "I know that if I needed extra help outside the lecture period, the lecturer would have found time to help me." (13).

In contrast, the responses to the statement "I put a lot of effort into this course" were: *'strongly agree' (1), 'agree' (8)*, '*neutral' (6)* and *'disagree' (2)*.

The students' additional descriptive comments are summarised as follows:

- Individual sessions were particularly beneficial (7);
- The practical aspects were valuable (6);
- The breathing module was valuable (5);
- The course should be permanent (4);
- BMg was valuable (4);
- The AT was valuable (3); and

- Individual comments included “such a valuable and interesting course”, “the course enriched my performance”, “we got to interact more”, “openness and not feeling worried that I am wrong”, “good for future of SA music scene”, “very well constructed”, “classes were very friendly and mind-opening”, “content more relevant for instrumentalists”, “disliked the journals” and “more practical application would have been great”.

5.3.2.2 Summary and conclusions

The collated answers substantiate the descriptive data derived from comparable post-course questions. Particularly noticeable was the fact that almost all of the students had found the course relevant and that most of the students’ interest in the subject matter had increased. It was interesting that the response from about half of the students regarding their general lack of effort corresponded with their lack of effort in the journal assignment.

5.3.3 The Post-Course Questionnaire for Teachers

The post-course questionnaire sent to the teachers of the 12 IPA participants was completed and returned by six of the 12 teachers.

5.3.3.1 Findings

The first three questions focused on whether the students had informed their teachers about their attendance at the course, whether they had discussed the course content with their teachers and whether their teachers had observed the students integrating what they were learning into their performance and attitudes to health, posture and awareness. The findings showed that only one student had done so and that this student’s teacher had noticed integration of the material.

The fourth question inquired as to whether the teacher had felt comfortable with their student attending a course of this nature. The subsequent three questions expanded

on that answer. Four teachers were comfortable with their students' attendance at the course and felt that the course content did not interfere with their teaching. One teacher was unhappy about two of their students' participation in the course as they felt that the course content may cause interference as the students in question were in their first year of study. The teacher felt that basic technique should be consolidated prior to taking an occupational health course.

The following two questions related to somatic methods. One teacher had received instruction in the Taubman technique, a piano method aimed at the development of healthy piano technique. Three of the teachers had done AT lessons, one of whom also had completed a certificate in remedial yoga teaching.

All six teachers answered *no* to Question 10: "Have you had any previous instruction in occupational health for musicians?" The following question was therefore redundant and remained unanswered. The final two questions related to any changes that the teachers may have noticed in their students. One teacher noted several improvements in their student (posture, physical ease, tension, practice results, tone, technique, musical expression, enjoyment and performance), commenting that it may have been associated with the student's participation in the course. One teacher stated that the course was definitely a contributing factor to their student's progress and that it had a positive impact overall. One teacher noted that they could not isolate any changes in their student that were specifically attributable to this course. However, he was very supportive of the student's participation in a course that enhanced student learning and growth by offering learning tools, promoting awareness and developing inspiration. It was interesting that one teacher, although dissatisfied with their student's involvement in the course, did report the student's increased confidence, enjoyment and performance ability, stating that it may well have been associated with the student's course attendance.

5.3.3.2 Summary and conclusion

The fact that only half of the teachers completed the form, despite reminders, was disappointing. One can speculate that this may be related to lack of awareness, disinterest or simply busy schedules. It was noticeable that only one student had communicated with their teacher about course participation. This reluctance may indicate a concern among students regarding the non-acceptance of health promotion strategies in traditional music pedagogical approaches and requires further investigation. The three teachers' positive comments on their students' development in relevant areas provided descriptive data supporting similar findings in the post-course interviews.

5.4 CONCLUSION

This chapter presented the analysis of the research data collected, with a focus on the results of the interview analysis employing the analytic approach of IPA. The semi-structured interviews revealed four superordinate themes, which were supported by a total of 20 subordinate themes. The questionnaire data was included to form substantiating descriptive information to aid in contextualising the interview data.

A synthesis of these findings will be offered in the next chapter with reference to the guiding research questions and literature review. In addition, recommendations, limitations and future directions for research will be discussed.

CHAPTER 6
DISCUSSION, CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

Chapter 6 concludes the thesis “Tertiary music students’ experiences of an occupational health course incorporating the Body Mapping (BMg) approach”. An overview of the study and a discussion of the themes emerging from the IPA will be provided to facilitate a dialogue between the findings and the literature, and to address the research questions. Finally, the recommendations, limitations and suggestions for further research will be presented.

6.2 OVERVIEW OF THE STUDY

This thesis investigated student musicians’ lived experiences of a musicians’ occupational health course incorporating the BMg approach. The need for the study lies in the limited amount of research on the implementation and assessment of health education in tertiary training for musicians. Musicians’ health research has been developing since the late 1980s, illustrating the alarming prevalence of performance-related health problems and strongly recommending prevention education. Yet limited data with specific emphasis on the experiences of tertiary level musicians participating in occupational health interventions are available. This is particularly relevant in South Africa, where musicians’ occupational health coursework in higher education currently does not exist.

Furthermore, the literature underscores the demanding physical and mental requirements of performance and the necessity for a biopsychosocial approach to prevention with the provision of body awareness work and postural training in occupational health education, including somatic methods. BMg, a somatic method designed for musicians, may be an appropriate and valuable inclusion to meet the

musculoskeletal anatomy, movement and proprioceptive training requirements within a health education intervention. Yet minimal research data on the integration of BMg principles into tertiary musicians' health training are available. The incorporation of BMg into this study therefore also stems from the need to investigate BMg as the somatic educational component of a comprehensive health intervention.

The purpose of the study led to the choice of a qualitative descriptive study design. The Interpretative Phenomenological Analysis approach was utilised for the thematic analysis of the semi-structured interviews conducted before and after the course. IPA is underscored by phenomenology, hermeneutics and idiography, and aims to explore how participants make sense of their experiences (Smith et al. 2009). The researcher's explicitly acknowledged and valued interpretation of the participants' subjective experiences during the MOHC sought to reveal deeper understanding and meaning.

The aims of the study were to gain insight into the experiences of the student musicians with regard to the MOHC, their perceptions of any changes that may have occurred, and their experiences of BMg as the somatic component of the course and musicians' health coursework as the first of its kind in the local context. Additionally, the research aimed to explore the students' experiences, perceptions and understandings of their biopsychosocial well-being and musicianship with regard to the physical-mental-artistic connections of music preparation and performance, and how physical and psychological awareness linked with the musical aspects and injury prevention.

6.3 DISCUSSION OF FINDINGS

The data analysis, presented in Chapter 5, revealed four super-ordinate themes: panorama, physical awareness, psychological awareness and musicianship, underpinned by a total of 20 subordinate themes. These themes will now be discussed with reference to the literature.

6.3.1 Panorama

6.3.1.1 Meaningful musical identity sets the scene

A profoundly meaningful life-long musical identity and emotional attachment to music and their instrument were evident in all of the participants. The undisputable meaning of a performing art for both the artist and society was also highlighted by Snowball (2016) and Hadok (2008). Similarly, musicians' connection with their instrument and passion for music were among the factors identified in the link between health and performance (Schoeb & Zosso 2012), suggesting the need for more integrated and thorough musicians' health approaches. Voltmer and colleagues (2012:13) also discuss the arguably most fundamental consequence of health and well-being interventions, relating it to musicians' intrinsic love for what they do: "Besides the positive influence on health, this would also help to preserve the joy and quality of the musical work of (professional) musicians".

The multiple beneficial and positive effects of music on well-being and quality of life, as discussed by Altenmüller and Ioannou (2016) and Oakland, Macdonald and Flowers (2014), were also described by the students. Together these elements established the students' strong desire and intrinsic impetus for their music-making, learning and career choice. Similarly, Ascenso, Williamon and Perkins (2017) identified various aspects, such as the role of music-making related to self-concept and identity, meaningful musical experiences bringing positive emotions and engagement, accomplishment being associated with inner goals and freedom of expression, all of which support musicians' well-being.

In relation to the emotional attachment suggested by the participants, Altenmüller, Ioannou and Lee (2015) remind us that it is necessary to recognise how the powerful attachment to musical aspirations may, in certain cases, have a negative impact when there is a tendency towards an obsessive perfectionism. Psychological tensions also are evident in that the love for music exists in conjunction with the fear of potential mistakes or failure (Altenmüller & Jabusch 2009). Kenny (2011) confirms musicians'

emotional investment in their performance and its contribution to the interaction between physiological and psychological problems.

6.3.1.2 Eager for preventative knowledge and skills

The students expressed their readiness, motivation and enthusiasm for the course. It was patently clear that they all wanted preventative tools and information in line with the body of research that shows that most musicians never receive health promotion and injury prevention education. The students' interest and curiosity highlight the known high PRHP prevalence rate (roughly 80%) among tertiary student musicians (Thaele 2016; Ioannou & Altenmüller 2015; Kok, Nelissen & Huisstede 2015; Norton & Greasley 2014; Brandfonbrener 2009). Ioannou and Altenmüller (2015) found that although about one in three students with PRHP did not seek treatment, indicating that non-disclosure is still prevalent, all of their participants were in favour of musicians' health education. This supports the present participants' views.

The literature demonstrates student musicians' low scores in health promoting behaviours (Rickert, Barrett & Ackermann 2015; Spahn, Nussek & Zander 2014; Williamon, Wasley, Burt-Perkins, Ginsborg & Hildebrandt 2009), yet most of the students in this study perceived musicians' occupational health as a very important and necessary area. They were all keen to learn, were highly motivated and, although somewhat unsure of what to expect, many had tried certain strategies. These, however, were in response to an already existing PRHP, confirming other research findings which illustrate students' lack of proactivity (Lima, Pinheiro, Dias & De Andrade 2015; Spahn et al. 2002).

The students displayed a strong collective 'need to know'. Their feelings of 'not knowing' were disenabling and discouraging. The prevailing lack of understanding from medical doctors, the frustrations experienced as a result of unproductive searches for advice and information and being left to fend for themselves have also been documented in the literature (Rickert et al. 2014b; Ackermann 2010; Pierce 2010; Palac & Grimshaw 2006).

However, while the participants in the present study were motivated and keen, research demonstrates that attendance at preventative interventions is often disappointing, pointing to disinterest, denial and reluctance to change (Ingle 2013; Park et al. 2007; Altenmüller 2003b; Brandfonbrener 2003). This is an important aspect, which suggests a need for greater awareness and deeper understanding at all levels in the music world.

6.3.1.3 Integrating valuable tools and broader understanding

Since behavioural change, integrating new skills and assimilating new information all take time, it was an aim of the MOHC to provide comprehensive content and beneficial tools that the participants could take away with them. This was accomplished in that many students described their experiences of these tools. This is in line with the literature, which demonstrates the benefits of health promotion education in reducing PRHP (Chan, Driscoll & Ackermann 2014; Laursen & Chesky 2014; López & Martínez 2013; Lee, Carey, Dubey & Matz 2012; Dommerholt 2010b; Barton & Feinberg 2008; Ackermann et al. 2002; Spahn, Hildebrandt & Seidenglanz 2001). Similarly, Rickert and colleagues (2015:14) argue for the currently accumulated research knowledge to be translated "into implementable teaching methods and curricula for music teaching institutions". Other studies also demonstrate that tertiary students must be taught about risk factors and prevention to equip them with the necessary preventative tools (Rasker & Bird 2013; Hoppmann 2010; Hansen & Reed 2006; Britsch 2005).

The participants' understanding of the course material initially centred on the immediate relief that their occupational health needs were being acknowledged. This was followed by apprehension, acceptance of change, and gradually developing cognisance of their long-term health responsibility and the commitment required. This patience to allow for change over time was also a feature which Buchanan (2011) identified as being important.

Broader understandings then emerged as the students contextualised their own particular musical and health needs as part of a bigger and more integrated perspective. This was in line with the research illustrating the biopsychosocial, multifaceted, interdisciplinary and collaborative nature of health interventions for tertiary music students (Ascenso, Williamon & Perkins 2017; Clark & Lisboa 2013; Palac & Grimshaw 2006), ideally targeting a range of skills including musical, performance-related, psychological, physical, interpersonal and professional. This broader view is shared by Rickert et al. (2015:2), who state: “The music education sector is well placed to be at the forefront of such injury prevention efforts because it is in music schools that students adopt the attitudes, values and behaviours that will define their professional careers”.

Acknowledging occupational health needs in the higher education environment was in itself significant for the students. In research by Ioannou and Altenmüller (2015) it was seen that mandatory study requirements and lack of knowledge among faculty caused less than a third of the students with playing-related pain to actually be able to follow the medical instructions given to them. Only 9% never played in pain, and their instrumental teachers’ responses mostly varied between advising rest, focusing on inappropriate technique and being dismissive, stating “it’s nothing serious, it happens” (Ioannou & Altenmüller 2015:137), all of which are indicative of lack of acknowledgement.

6.3.1.4 Enabling perspective and compassion through group diversity

A positive and supportive learning environment was experienced by the students. This fostered their engagement and participation which, in turn, facilitated relevant discussion, empathic sharing and dynamic peer learning. The participants commented specifically on the diversity of the group as enjoyable and inspiring. Their observations and perceptions centred on the value of the open, mutually respectful, accepting and supportive behaviours that were evident during classes. This was described as unusual and suggests that an underlying negative and competitive ethos may be more common. In line with this, Pierce (2012:158) states emphatically that a fundamental

shift must occur to establish: "…a balance of competition and nurturing in the education of musicians; one that embraces person-centred learning and includes elements of the various value systems, including personal and collective wellness." In the same vein, Rickert, Barrett and Ackermann (2015) affirm that attitudes reinforcing the competitive performing arts culture contribute to high injury rates and poor health behaviours.

Positive learning experiences, peer support, disclosure and supportive group culture are addressed in the literature. Altenmüller (2016:51) highlights the critical role of the music teacher in fostering positive learning experiences, explaining that "a rich artistic environment, empathy and emotional depth will contribute to a successful musical education and interaction". Ascenso et al. (2017) identified various important psychosocial factors needed to support student musicians in the transition into professional life, one of which was the creation of supportive peer networks. Rickert, Barrett and Ackermann (2013:219) emphasise "positive and supportive organisational culture", as research has shown that "increased social support and the presence of a supportive group culture leads to lower levels of physical and psychological injury and increased productivity".

6.3.1.5 Body Mapping opened my mind to my body

Teaching relevant movement anatomy as part of musicians' occupational health education has been recommended in the literature (Rickert et al. 2015; Rodríguez-Lozano et al. 2011; Akel & Düger 2007; Heming 2004; Hildebrandt & Nubling 2004; Zuskin et al. 2004). The students perceived BMg as highly valuable and beneficial, and participated keenly in the practical BMg activities, describing BMg as a useful way for musicians to learn anatomy. The kinaesthetic or proprioceptive aspect of learning the BMg approach was understood and experienced by almost all of the participants, enabling them to grasp how smaller parts relate to the whole, with an easy and natural body awareness. Dommerholt (2010a) and Buchanan (2011) explain how this type of somatic method develops sensory awareness of ineffective movement habits and teaches how to correct these through integrated body use, using both proprioceptive

responsiveness and cognitive skills. Lee, Carey, Dubey and Matz (2012) highlight how kinaesthetic re-education integrates the kinaesthetic, cognitive and emotional aspects of postural patterns, facilitating improved mind-body reciprocal associations. An illustrative excerpt of one of the participants (Jayden) sums this up: “I think it’s everything a musician should know, and I think I have kind of opened my mind to my body because we are doing physical things where we actually need to know what’s going on.”

Thus, BMg facilitated a knowing, which answered the students’ pivotal ‘need to know’ mentioned earlier through teaching accurate relevant musculoskeletal information and proprioceptive skills. These were empowering as they could be adapted and assimilated by each individual student as needed. Participants commented on various benefits of BMg, such as knowledge of body biomechanics helping to achieve technical needs and solve problems, clarifying vague or metaphorical pedagogical instructions, pain reduction, and reducing both mental stress and muscular tension. The reduction of tension was a significant benefit mentioned by almost all of the participants, and facilitated improvements in postural balance and alignment. Additionally, impacts associated with feeling more embodied and connected were also described. These BMg aspects will be discussed in considerably more depth in the pertinent specific subordinate themes that follow, within the super-ordinate themes: physical awareness, psychological awareness and musicianship.

6.3.1.6 Course appraisal commentary

This theme was mostly descriptive as it was a grouping of participants’ evaluative feedback, critique, highlights and thoughts on the content and structure of the MOHC. All of the students perceived the practical activities as most enjoyable and valuable, generally requesting a longer course in future so that the number of practical and experiential learning sessions could be increased. This feedback for more ‘learning by doing’ was significant in that it confirms the value of the experiential aspects of musicians’ health courses, which are necessary for acquiring embodied knowledge. Buchanan (2011) similarly found that practical master classes were beneficial as they

assisted in the integration of theoretical knowledge with the experiential physicality of performance. This is described by Cox (1990:8) as ‘feeling-knowing’ in that true embodied knowledge is accessed through sensorimotor experience in contrast to an intellectual approach. Likewise, a more embodied approach to music pedagogy is generally advocated by Nijs, Lesaffre and Leman (2009), and Bowman and Powell (2007). The incorporation of somatic approaches into musicians’ health education supports this more experiential, practical approach to the acquisition of postural and sensorimotor skills.

Inviting visiting lecturers from specialised fields, such as audiology, was suggested by some of the students. Similarly, many had enjoyed the visiting AT teacher, who had presented the focused AT lecture and practical session. This sharing of expertise is important, and the collaboration of music educators and health professionals is recommended in the literature (Palac 2015; Rickert, Barratt & Ackermann 2015; Clark, Williamon & Redding 2013).

AT constructive rest was described as a highlight by many students and was enjoyed by all of the students. The purpose is to practise various aspects of kinaesthetic and inclusive awareness (Vining 2008). The value of balancing rest with activity is also discussed by Batson and Schwartz (2007).

6.3.2 Physical Awareness

6.3.2.1 The whole me

Almost all of the participants described their experiences of enhanced whole-body awareness with perceived benefits, including reduced tension, enhanced sound, better technique, easier coordination, more stamina and improved breath support. They described their understanding of a more integrated and coordinated body use, grasping the concept of the connection of the parts to the whole. The participant, Max, illustrated the shared experience of this theme succinctly: “By making me aware of the

whole me, the whole body, how my whole body should be part of my bass when I'm on stage. How everything should be in sync when I'm on stage; that just made everything easy for me."

Musicians' fine motor coordination is highly developed and vital, which is why the phrase "small muscle athletes" is commonly heard (Manchester 2009b:101), but the importance of whole-body use cannot be overlooked (Ackermann, Adams & Marshall 2002a). Ackermann (2010) explains the importance of whole-body use, asserting that it should be addressed by means of proprioceptive and sensorimotor training. Deficiencies in proximal posture can cause distal upper extremity symptoms, hence the need to be aware of whole-body biomechanics (Melton 2009; Brandfonbrener 2006; Shafer-Crane 2006).

The key shared aspects here were that prior to the course, the participants had a tendency to focus on parts in isolation from one another. The emerging perceptions of an interconnected and integrated body aided in reducing limitations in technique and coordination, therefore improving ease and enhancing performance.

6.3.2.2 Appropriate tension release

In this theme it was evident that the participants' appropriate exertion and tension release facilitated efficient and comfortable performance. Research confirms that reducing unnecessary tension and effort, and increasing efficiency are goals of somatic methods, such as BMg and the AT (Carpinteyro-Lara 2014; Speck 2009).

Prior to the course, students described how they had perceived the negative impacts of restrictive tension, but also described their inability to perceive the excess muscle tension itself during playing or singing. Some were aware of elevated muscle tension during performance but felt unable to 'relax', describing frustration, limited breathing, over-analysis and discomfort. A known risk factor for PRMD is the combination of uncoordinated muscular activity with excess tension during repetitive movements (Wu

2007; Bejjani, Kaye & Benham 1996). Baadjou et al. (2014), and Guptill and Zaza (2010) also highlight the importance of reduced force and tension.

The students identified MPA as a significant cause of excessive and unpleasant muscular tension, confirming their understanding of the interaction of psychological and physical aspects. This is widely recognised in the literature, where it is demonstrated that increased muscular pain and tension are linked to psychological aspects, such as stress, anxiety, depression and MPA (Kenny 2016; Lima et al. 2015; Ackermann, Kenny, O'Brien & Driscoll 2014; Rietveld 2013; Zander, Voltmer & Spahn 2010; Levy, Lounsbury & Kent 2009; Akel & Düger 2007; Kaneko, Lianza & Dawson 2005; Kirchner 2003; Davies & Mangion 2002).

Participants claimed that as a result of the course, they had learnt how to perceive elevated muscular tension and ways to manage it, as portrayed by Jolene: "I wasn't like holding on so tight", and Willem: "not trying too hard." More refined proprioceptive monitoring and tension awareness was evident both from their personal accounts and my observations. The students described their awareness of breathing, and sensing less rigidity and stiffness. Also important was the fact that becoming more aware of their sound, expression and surrounding environment resulted in their being able to ease muscular tension. Mandla learnt to monitor tension in his whole body, not only in his arms, which had been his focus due to pain. His awareness of quality of movement and tension release enabled considerable reduction in pain and discomfort, and increased enjoyment, confidence and musical freedom. Several students were similarly empowered, and shared a newfound confidence, with both security and freedom in their playing or singing.

BMg seems to be particularly valuable in this regard as the teaching outcome is to understand the structure, movement and interconnectedness of the body, combined with the acquisition of proprioceptive skills. These skills enable musicians to address the problem of excess muscle tension, and learn to play with more biomechanical efficiency, correcting technique to be more poised and comfortable (Buchanan 2011). Training of proprioceptive acuity is emphasised in the BMg method and is critical for

musicians due to the link between movement and sound quality, and the risk of pain and injury from repetitive movement (Smitt & Bird 2013; Krayer-Luke 2009).

6.3.2.3 Postural and movement choices

As poor posture is a major risk factor for PRMD, developing appropriate postural and movement choices is integral to the multiple fluctuating requirements of playing or singing, which is discussed at length in 2.9.1. In this study, the participants described how acquiring improved postural awareness skills had reduced pain and discomfort, and perceived their playing as having improved. The concept of finding balance, rather than focusing on a static postural ideal, was thus significant. Ackermann (2010) explains this balanced state as gentle shifts in balance and whole-body mobility to facilitate playing movements in both sitting and standing. Shoebridge et al. (2017) identify essential qualities, such as continual rebalancing and adjusting of the body with the instrument, the musical requirements and the environment, conceptualising posture as “a cognitive, emotional, physical, situation-specific response” in which the whole person is involved (Ibid. 2017:825).

The students enjoyed learning about posture and breathing interactions. Awareness of head balance on top of the spine at the atlanto-occipital (AO) joint was a major benefit for several students, whereas understanding posture and balance as integrating the whole body was significant for others. Several students commented on perceiving their advantageous new awareness of their legs and feet. Linking with the theme “Appropriate tension release”, a newfound grasp of quality of movement as part of posture was experienced by most students as helping with injury prevention. This aspect is endorsed in the literature (Shoebridge et al. 2017; Baadjou et al. 2014; Guptill & Zaza 2010; Steinmetz et al. 2010).

In prior qualitative studies by Buchanan (2014) and Woodard (2009), their results suggested that movement quality improved in the perceptions of their participants as the body map was corrected. Understanding movement as integral for musicians is a central principle of BMg. The fact that movement creates sound and the quality of the

movement of the entire body determines the quality of the sound is critical. Hildebrandt and Nubling (2004) confirm that because the body and its movement create the sound, movement awareness and re-training are beneficial for musicians.

Bindel (2013:55) writes: “A musician should be able to recognize the quality of her movement in order to regulate the amount of effort she exerts, such that effort appropriately matches the task.” Mandla illustrated this key skill and its musical consequences as he described his change from continuous tension and over-emphasis on “precision” to his sensitivity to quality of movement and ability to monitor exertion to support the musical expression. This movement awareness was expressed by many students in multiple ways, with the emergence of a shared cognisance of the synergy between musical and postural aspects. The interactions of musical and movement aspects developed into an ability to link musical intentions to physical, movement and gestural awareness. In this way, musical intention and characterisation assisted the movement and body awareness.

Buchanan (2011:90) reminds us that movement quality is essential for musicians as it is “the key to musical expression and communication”. Schlinger (2006:865) sums up succinctly that the goal of somatic approaches is to help musicians to “connect the artistic process with non-injurious integrity of movement”. Likewise, Macritchie and Zicari (2012) concluded that movement efficiency and awareness are essential and change according to the performer’s musical intention.

6.3.2.4 Physical ease and freedom

Participants’ experiences of discomfort, pain and injury had caused musically and personally disabling limitations, and a range of strong emotions were described such as “distressed”, “deterred”, “afraid”, “despondent”, “worried”, “terrified” and “not coping”. The emotional trauma caused by injury is well demonstrated in the research (Rickert et al. 2014b; Oakland, Macdonald & Flowers 2014; Schoeb & Zosso 2012; Grant 2009; McCready & Reid 2007; Buller 2002).

My observations and the students' narratives of their experiences after the course were consistent in that physical ease and freedom predominated, which facilitated improvements in technique, posture and stamina, as well as musicality, enjoyment and confidence. Feeling enabled by the physical ease and freedom rather than disabled is therefore the conceptual notion framing this theme.

I identified the reciprocal cooperation of physical ease, musical interpretation and technique. This echoes Buchanan and Hays (2014:4), who state that because BMg focuses specifically on musicians' needs, "it provides a foundation for educators to teach musical technique in combination with movement training". In a similar way, a study by Valentine and Williamon (2003:93) found that AT training for musicians improved both technical and musical quality of performance, as well as their body use.

Several students perceived their improved body awareness as supporting their technical needs and found that accessing their musical intention was a good starting point to access the appropriate physical awareness to develop technique. The participants were motivated and inspired by their independent abilities to discover, learn and find their preferred ways of attending to their needs, thus building an inner confidence, strong determination, capacity for resilience and therefore growth.

6.3.2.5 Allowing myself to breathe

Experiences of breathing awareness among the participants developed during the course, from perceptions of control and restriction to perceptions of allowing and flow. They described great enjoyment of the practical activities and experiential learning during the BMg module on the structures and movements of breathing. Their understanding of breathing became interlinked with multiple aspects, such as postural improvements, tension reduction, anxiety management, technical control, expression and communication, kinaesthetic sensitivity and mindfulness. It is notable that their breathing awareness expanded to become a pivotal aptitude enabling attentiveness to bodily feeling within psychological, physical and musical lived experience.

Lee et al. (2012) explain that optimal breathing is essential for musicians as it allows for the release of physical tension and freer muscular coordination. Postural variations limit or assist breathing capacity, ease and breath support (Ackermann, O'Dwyer & Halaki 2014; Ackermann 2010), and breathing awareness is an important tool for optimising posture (Baadjou et al. 2014; Lee et al. 2012), and a positive strategy for coping with stress (Khalsa et al. 2013; Kenny et al. 2012).

6.3.2.6 Auditory, kinaesthetic and spatial integration

As seen in the previous themes, the perception of enhancement of kinaesthetic/ proprioceptive sensitivity has been a recurring trend. This particular theme, however, now comprised the collective experiences of an integrated sensory responsiveness as the participants' experiences of spatial and sensory inclusivity developed during the course. Integrating auditory, kinaesthetic and spatial awareness is the dominant feature of this theme.

As Eddy (2009) explains, the fundamental goals of somatic methods, in addition to identifying habitual patterns that may require change, are the integration of proprioceptive and kinaesthetic awareness, movement coordination and self-perception in relation to the environment. Buchanan (2014) and Bindel (2013) note the importance of cultivating an integrated sensory awareness. The term 'inclusive awareness', used in the AT, is used to describe this integration of the senses, and an ability to perceive oneself and the surrounding environment simultaneously and fluidly (Marsh 2014; Caplan 2009; Malde et al. 2009; Pearson 2006). Developing an inclusive awareness enables musicians to be fully 'present' with respect to physical, psychological and artistic awareness (Buchanan 2014; Pearson 2006). The tactile, auditory and visual senses are also developed in the context of whole-body awareness, together with the consciousness of other sensations and emotions, such as emotion, pleasure, pain, hunger, thirst and temperature (Marsh 2014:9; Caplan 2009:12; Vining 2008:13).

The students in this study explored listening as an integrated sensory and kinaesthetic experience and described experiences such as listening to their sound in the whole surrounding space, and discussed their perceptions of the significance of how one listens. The spatial awareness enabled perceptions of letting go, opening up, confidence, hearing better and relating to the audience more naturally. I observed their total immersion in the task, as well as an open easy relatedness to the environment. This is echoed in research explaining the importance of efficient sensorimotor integration, with the linking of auditory, artistic and movement awareness as a critical element (Altenmüller & Ioannou 2016; Ackermann 2010). Ackermann (2010:267) concludes that because "the ultimate goal of the musician is to create a high-quality sound", integrating auditory awareness with posture, technique and efficient whole-body use is critical. Similarly, the correlation of the best sound with the best biomechanical movement quality was demonstrated in research by De Lisle et al. (2006).

6.3.3 Psychological Awareness

6.3.3.1 Attitudes

The theme 'Attitudes' is a collective of somewhat more idiographic representations of the individualised ways in which students related psychologically to their playing and singing before the course. There was a range of perceived attitudes, such as dissatisfied, unhappy, despondent, self-critical, destructive, distracted, external locus of control, acceptance, perseverance, patient, logical, motivated by challenge and inspired.

Two thirds of the participants perceived their ability for pragmatic ways of thinking, employing various proactive behaviours for engaging with challenges. While some were patient, others had a logical mindset, others were motivated by challenge and still others focused on the positive influence of music and described having fun. Among

the latter group, I sensed their underlying ability to separate self-worth and identity from their performance level.

One third of the participants described their highly self-critical attitude, with self-doubt and destructive thoughts and beliefs. A tendency towards low self-esteem and self-sabotage, with negative, polarised judgments, lay beneath many of these perceptions.

Many student musicians' attitudes are influenced by the teaching and learning environment to which they are exposed (Guptill 2011c; Nagel 2009:17). Price and Watson (2011:323), Horvath (2008:32-33), and Altenmüller (2016:51) therefore highlight the music teachers' role in assisting students to develop a healthier attitude to playing by balancing the physical, mental and emotional challenges and fostering positive learning experiences. Further discussion on positive, constructive attitudes and behaviours will be provided in the next sub-section.

6.3.3.2 Self-evaluation capacity and constructive acceptance

After the course, almost all of the participants described their experiences of a more constructive attitude towards their playing or singing, particularly in practising, therefore becoming more productive. On the subject of students' psychological attitudes and coping strategies, Bonneville-Roussy, Lavigne and Vallerand (2010) suggested that behavioural skills also be incorporated into tertiary music training to promote well-being. They discuss the destructive aspects of extrinsically-driven, comparative and obsessive behaviours, compared to positive intrinsically-motivated behaviours which are constructive and adaptive, facilitating deliberate practice and nurturing well-being. The descriptions among the participants in this study included several intrinsically-motivated behaviours, such as focusing less on perfection and more on improving and finding personal fulfilment; monitoring own progress; more assertiveness in musical expression enabled increased confidence to think independently; more proactive practice; less focused on results and being right; having realistic expectations; taking responsibility; managing the internal critical voice; and pacing oneself better. The resulting understandings were diminished fear of failure,

more appropriate goals and far more satisfying outcomes. Fundamental self-directed behaviours that supported effective learning and positive growth mindsets, such as constructive self-evaluation, monitoring, reflection, resilience and problem-solving skills, emerged.

Acceptance of themselves and their progress was commonly experienced among the study participants. They were developing constructive ways of dealing with their 'issues', were more motivated to solve problems, more compassionate towards self and others, and generally displayed resilience in terms of managing challenges. In contrast, Montello (2010) describes the negative perceptions that can result when musicians' self-worth is based on external assessments of their playing as they often display perfectionism, low self-esteem, compulsive behaviour, a need for external approval, isolation, extremes of emotion, anxiety and depression. Her article therefore also corroborates the important implications of the positive behavioural capacities that emerged among the participants in this study.

6.3.3.3 Performance anxiety: debilitative and facilitative

This theme depicts the students' experiences of MPA before the course, including the debilitative and facilitative characteristics, aspects of MPA that are documented in the research. Certain types and levels of arousal may be a severe hindrance or even incapacitating in terms of performance, yet a moderate level of arousal enables enhanced focus for optimising performance. Facilitative arousal was experienced by four of the students in this study, who described enjoying the excitement and adrenalin of performance.

Some of the frequent causes of MPA are self-pressure, lack of preparation, lack of self-confidence in general, repertoire level difficulty and fear of extreme physiological arousal (Osborne, Greene & Immel 2014). The combination of the individual performer's trait anxiety, with the level of task mastery, together with the degree of perceived situational stress, are the three main aspects that interact to impact on performance quality (Kenny & Ackermann 2009). The physiological symptoms of

arousal may, however, be interpreted as debilitative (Osborne, Greene & Immel 2014). Spahn et al. (2010) found that the actual perception of the physiological arousal was the determinant, causing it to become energising and facilitative in some cases, but negative and debilitating in others. Research agrees that the complex physiological and psychological variables of MPA, together with the diverse individual perceptions, responses and behaviours, require multidimensional prevention and treatment approaches. This is echoed in the variety and complexity of experiences described by the participants in this study. These participants were articulate in expressing the diverse facets of their performance anxiety experiences, perceptions and understandings.

I recognised the interactions between the physical and psychological aspects. The non-linear, multidirectional and multidimensional associations were complex and personalised. The coupling of mental and physical aspects was evident from several participants' accounts of their experiences. The literature echoes similar cognitive, physiological and behavioural elements of MPA that were described by these students (Kenny 2011; Lehman, Sloboda & Woody 2007; Ostwald et al. 1994).

6.3.3.4 Performance confidence and enjoyment

This theme reflects the pervasive performance confidence and enjoyment that emerged. The students were all portrayed individually in the data analysis to illustrate the nuances and particularities. In general, they described being more confident performers since the course, perceiving the performance psychology strategies that they had learnt as helpful. They felt that their attitudes and behaviours had changed and, in general, a more positive attitude and enjoyment of playing were stimulated by the course.

What could be seen from those descriptions in Chapter 5 is that MPA is variable and highly individualised, which is reflected in the personalised management skills utilised. The literature confirms this multifaceted nature and mentions various strategies to enhance performance confidence, such as mental imagery, positive self-talk, self-trust

and focusing on the music (Lee 2002:37). Spahn (2015) discusses how multidimensional approaches are suggested as they attend to both the psychological and physiological symptoms. Kenny (2011) outlines beneficial interventions for MPA, including cognitive behavioural and psychodynamic therapies, as well as performance-based approaches. Braden, Osborne and Wilson (2015) suggest positive psychology techniques, and Farnsworth-Grodd (2013) demonstrated that mindfulness training enabled self-regulation of MPA.

6.3.4 Musicianship

6.3.4.1 Inconsistent practice

The students faced challenges and inconsistencies in their approaches, behaviours and experiences associated with practice prior to the course. This is of concern since it has been documented that poor practice methods are one of the risk factors for PRHP (Chan, Driscoll & Ackermann 2014; Hoppmann 2010; Dommerholt 2009).

It was clear that many of the participants would benefit from developing more advanced practising competencies, including self-regulation and self-evaluation skills, together with better kinaesthetic awareness to monitor exertion levels and their interaction with musical aspects. Researchers agree on the importance of teaching students about efficient practice methods for both injury prevention and achieving results (Ackermann et al. 2015; Dick et al. 2013; López & Martínez 2013; Dawson 2012; Rosenbaum et al. 2012; Guptill & Zaza 2010; Hoppmann 2010; Lederman 2010; Foxman & Burgel 2006).

6.3.4.2 Productive practice

An important new awareness for the students was that practising required continuous planning, monitoring and musical, physical and psychological engagement. This is reminiscent of the well-known study by Ericsson, Krampe and Tesch-Römer (1993) in

which ‘deliberate practice’ was explained, comprising structured, goal-oriented and ‘effortful’ activity necessary for developing expert instrumental skills.

I sensed that all of the students were integrating into practice the material they had been learning throughout the course, for example, BMg concepts and postural corrections. Almost all of the participants described having learnt helpful practice methods and many perceived practising as more efficient, enjoyable and less emotionally and physically stressful. Having clear musical intentions, which integrate technical, musical and physical awareness aspects in practice, became an effective tool in practice for several students. Other experiences were described, such as mental practice, improved quality of awareness, a more structured approach to practicing, really listening, quality of practice, shorter and more regular sessions, taking breaks, a slower and more thorough approach to warm-ups, mental preparation, and connecting practice and performance. Practising was experienced as more enjoyable with their more constructive and proactive approaches. Practice sessions were perceived as more efficient and less frustrating because of the utilisation of constructive evaluative skills and positive psychology. Self-reflection and self-regulation were evident.

According to Lehman, Sloboda and Woody (2007), self-regulation is vital. Williamon and Valentine (2000) support aspects that were emerging as competencies in the participants of this study, such as the quality of the practising, which is associated with motivation, maturity and emotions, as well as aspects, such as practice duration, consistency and utilising varied strategies. Ericsson (1993) also mentions key aspects which were described by the participants, such as sustained motivation, focused attention, and the skill of constantly evaluating and improving playing during practice. Strategies explained by Altenmüller (2016:51) as part of constructive practice were also echoed by this study’s findings, such as taking breaks to allow for motor learning to consolidate (including sleep); mental practice; varying the focus of practice to prevent physical and mental fatigue and overuse; developing individualised constructive practice strategies; avoiding going beyond physical and mental limits; and

understanding the impacts of over-practising, destructive self-critique and perfectionism.

6.3.4.3 Musical disembodiment

Woodard (2009:155) refers to musicians as being “disembodied spirits” and discusses the problematic notion of a creative spirit or intellect without corporeality. In a similar way, Palac and Grimshaw (2006:877) consider how many musicians “tend to be somewhat disembodied; their awareness of their whole selves extends almost exclusively to the parts involved directly with musical technique”.

That discourse is reflected in this theme, which encapsulated some of the participants’ perceptions of a lack of bodily connection with their music-making, expression and artistry. It revealed several critical perceptions and understandings of either musical disembodiment or a longing for more embodied musical artistry. Aspects that were noticeable as a result were lack of musical communication, performance anxiety, poor stage presence, and physical and musical rigidity. A few students experienced an absolute disconnectedness from their music-making before the course, which was a limitation and an obstacle to authentic artistry. These students either could not or would not conceive of themselves as artists. Artistry seemed to be a future notion, or perhaps was believed to be reserved for only very few elite performers. Those students who desired a physical, emotional and expressive connection with the music described these as aspirations and ideals. These notions were important for the participants, but appeared in the form of an abstract cognitive knowing rather than an embodied musical experiencing.

6.3.4.4 Musical embodiment

All of the participants portrayed the theme of musical embodiment. The literature on somatic methods for musicians emphasises the importance of a musically-embodied approach. Mullan (2014:258) asserts how the underlying philosophy of somatics supports the “whole person” and the lived embodied experience, and Woodard (2009)

emphasises that understanding movement perception improves a musician's sense of embodiment, which is imperative to music-making.

Experiences of feeling more physically comfortable and musically expressive were enabled through enhanced body consciousness. Fulfilling and engaging musical embodiment could be accessed through the body or music. Musical intention underscored musical embodiment in several participants, while an awareness of interpretative communication with the audience was a key aspect supporting other students' musical embodiment.

The sense of being and feeling "more at home" is reflected in many of the participants' narratives. Musical embodiment and accepting an identity as an artist brought the musician home. This is poignantly echoed by Conable and Conable (1995:21), who wrote that:

> we develop the ability to bring body feeling into consciousness in a comfortable, ongoing way. Most people experience this as a kind of coming home. There is a relief in it, in becoming embodied again. It turns out the effort is not in feeling our bodies but in not feeling them.

6.4 ADDRESSING THE RESEARCH QUESTIONS

The main research question which steered this study was:

What are the student musicians' lived experiences of a musicians' occupational health course incorporating the BMg approach?

The main question could be answered insightfully by this research as seen in the results presented in Chapter 5, as well as the discussion of findings under heading 6.3 in Chapter 6. Due to the IPA nature of the study and my choice not to summarise further and risk dilution of the depth, richness and nuance of the descriptions,

interpretations and narrative account already presented, the following section will briefly highlight the aspects that stood out, pertinent to each sub-question.

The four, more specific sub-questions were:

1. What are the students' experiences, perceptions and understandings of the course, and their associated biopsychosocial health and musicianship?
2. What changes did the students perceive in themselves and their music-making as a result of the course?
3. What are the students' experiences of BMg as the somatic component of the course?
4. How was the course experienced as the first of its kind in the local context?

6.4.1 What Are the Students' Experiences, Perceptions and Understandings of the Course, and Their Associated Biopsychosocial Health and Musicianship?

The students' meaningful musical identity established their commitment to the course, interest in the material, and motivation for change and learning. Their understandings of their occupational health and well-being grew from their initial relief that their occupational health needs were being acknowledged, to accepting their responsibility, and patience to allow for change over time. Disclosure, mutual respect, empathy, musical inspiration, enjoyment and broader perspectives were facilitated by the positive, diverse and supportive peer group learning experience. The interdependence of psychological, physical and musical (both expressive and technical) aspects became more clearly understood, perceived, applied and valued.

6.4.2 What Changes Did the Students Perceive in Themselves and Their Music-Making as a Result of the Course?

The students described acquiring multiple tools and broader understandings, such as strategies for developing performance confidence, preventing PRMD and managing

their well-being. An enhanced whole-body integrated awareness enabled perceptions of improved physical ease, better coordination, technical development skills, enhanced musical expression and more appropriate muscular exertion. A key new understanding was that these elements were reciprocally beneficial, for example clearer musical goals enabled more effective movement choices and vice versa. Postural and movement choices aided in the reduction of pain or discomfort and playing their instruments or singing was perceived as better than before the course. Intrinsically-directed behaviours and attitudes emerged, including being more compassionate towards self and others, developing resilience to manage challenges, improved self-regulation in practising, constructive self-acceptance, appropriate goal-setting and expectations, and better self-evaluation capacity.

6.4.3 What Are the Students' Experiences of BMg as the Somatic Component of the Course?

The students enjoyed the BMg modules, participated keenly in practical activities, perceived BMg as both valuable and beneficial, and described unanimously positive experiences. The crux of their experiences of BMg is captured in the statement: "BMg opened my mind to my body." They also experienced their playing or singing as more musically embodied. BMg enabled a 'knowing', which addressed the students' central 'need to know' because the relevant musculoskeletal anatomy and proprioceptive skills were perceived as empowering. Each student was able to apply them appropriately to their own needs and level.

6.4.4 How Was the Course Experienced as the First of its Kind in the Local Context?

Readiness, engagement, openness and curiosity were evident in the students' collective strong 'need to know'. Most participants perceived the course as beneficial and described their interest as having grown.

Some helpful feedback on the less beneficial features was provided. A few of the students remarked that the academic and theoretical content had been least helpful to them. All of the students described the practical content as most enjoyable and beneficial, generally requesting a longer course in the future to accommodate more of that aspect. Many of the students disliked the journal assignment, one did not like the AT session, the singers both requested additional content more specific to their needs, and one participant requested that the specialist expertise of an audiologist would improve the hearing conservation module.

All of the participants described musicians' occupational health as a relevant, necessary and important topic. Prior to the course, they had limited knowledge about musicians' health and it had opened their eyes. Particular words used by several participants illustrated their endorsement and positive course experience more emphatically, such as "extremely useful information", "imperative", "fundamental", "vital", "neglected", "extremely eye-opening", "very very important", "valuable" and "good for future of SA music scene".

6.5 RECOMMENDATIONS

The findings of this study provide qualitative data on the implementation and assessment of occupational health courses in tertiary music education. Thorough examination and analysis of the student participants' experiences, perceptions and understandings of a course of this nature therefore contribute to the existing knowledge base in musicians' occupational health research.

An important implication of these findings is that the interaction of physical, psychological and musical aspects needs to be taken into account in the provision of musicians' health courses as part of their tertiary education. The study suggests that BMg, the musicians' somatic educational approach employed in this course, may therefore be highly beneficial due to its apparent or anecdotally substantiated capacity to teach the integration of the biopsychosocial and artistic skills that musicians require.

It also emerged that a positive engaging social environment in the class, with peer learning and support, enhanced the benefits.

This research has several practical applications:

1. It points to the expedience and value of the inclusion of BMg as a possible somatic educational component of musicians' health courses.
2. The study substantiates that musicians' occupational health course content comprises the four broad categories of musicians' health promotion as defined in the literature: neuromusculoskeletal, psychological, hearing and vocal health.
3. Additionally, the research results confirm the need for the inclusion of course content to teach efficient practising approaches.
4. This research supports the need for interdisciplinary collaboration between musicians and health professionals. Thus, specialist input in musicians' health courses, acknowledging the imperative need and mutual respect for both musical and medical expertise, is recommended.
5. Regarding the length of musicians' health courses, the research data suggest that behavioural change and knowledge assimilation from health and well-being education take place over time. Thus, for example, one semester of 13 weeks, with a weekly 90-minute class, is a minimum length. However, the implication emerges that a full year of 26 weekly sessions would be optimal.
6. The findings suggest that practical and experiential learning applications and activities are imperative and that the importance thereof has been underestimated. These include movement activities and exercises, as well as practical performance master classes with the instrument or voice. Therefore, course planning should make adequate provision for this in terms of course duration and venue suitability.
7. On the topic of curriculum planning, the data also suggest that adaptability is necessary to ensure that the material is relevant to the personalised needs of the student attendees.

8. Regarding student attendance, the results suggest that a mixed class of students with diversity across year levels, genres and music study streams was beneficial.
9. While the data was inconclusive in relation to the question pertaining to the optimal year level for health promotion coursework, it is important to note that it confirms that student engagement, motivation to attend and readiness for change are criteria that should be considered.
10. The study data endorse the need for communication and cooperation with instrumental and vocal teachers in musicians' health courses.

6.6 LIMITATIONS

A number of important limitations need to be mentioned. The small sample size used in this study limits the generalisability of its findings. However, the results of the research are transferable so as to provide insight into other similar contexts. There was no control group because the research aim was not to "test" the results of the implementation of such a course but rather to conduct an IPA study regarding the participants' experiences.

As researcher and course instructor, my dual role may have influenced the students' perceptions and their accounts during the interviews. It is known that participants in this situation may be somewhat reluctant to express their negative or critical views. Therefore, I discussed this openly with the participants during the interviews, and encouraged them to speak frankly and honestly to facilitate the gathering of rich and discerning accounts. Although it is possible that the students may have selected their comments judiciously, it is evident from the interview transcripts that their accounts were highly personalised and vivid, containing strong opinions and views. They did not, in any way, seem afraid to speak out. The anonymous questionnaire after the course was therefore helpful in that the data obtained corroborated the interview findings.

Moreover, as a qualified Andover Educator, my bias towards BMg as an applicable somatic educational method for musicians must be made explicit. I was therefore extremely cautious not to over-interpret positive experiences of the BMg-related interview data. During the classes, I also strove not to influence the participants towards positive evaluations of BMg, but encouraged much debate, questioning and discussion.

An additional study limitation was the students' poor response to the journal assignment. This bears further consideration in order to explore the reasons for this and to develop improved written self-evaluation measures for students participating in health interventions.

6.7 FURTHER STUDY

This study has opened up many questions in relation to further research in musicians' occupational health education. Importantly, building research capacity in SA is imperative as the current research in performing arts health is noticeably lacking.

Research across several study sites to compare the experiences of students in different contexts would be valuable. It might be useful to run quantitative studies with controls and outcome measures, such as standardised well-being inventories and/or expert panel ratings of performance that verify the findings. Also worthwhile would be to run parallel studies but with different somatic or physiological components to enable comparison of the somatic aspect. A mixed-methods approach to this evaluative research in the implementation of health literacy education would be advantageous as current research is predominantly qualitative. Utilising mixed methods in which the strength of one compensates for the weakness in the other, may facilitate more comprehensive investigation, incorporating various perspectives.

Musicians' occupational health provision in multigenre and multicultural contexts is underexplored as most of the current literature focuses on Western art music. This is an exciting area suitable for development in the SA higher education context.

Further investigation into health literacy in musicians is also needed to establish a clear definition and understanding of core competencies, and to develop reliable and efficient standardised measurement tools.

Also needing consideration is the fact that musical curricula in higher education are already heavily loaded with courses. It is therefore vital to investigate the possible integration of health education into existing courses, for example as part of pedagogical or teaching methods training. In addition, future research is needed to assess the feasibility, implementation and efficacy of the online provision of musicians' occupational health courses.

6.8 CONCLUSION

This study has highlighted the need for musicians' occupational health education to be embedded within tertiary music training, underscoring the value of BMg as the somatic component. Furthermore, it affirms that the implementation of effective prevention interventions for musicians has been neglected and is the key to noticeable change. It has become a priority to investigate how to engage with the tertiary music education environment to equip the next generation of music teachers and performers with improved occupational health literacy.

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ADDENDA

ADDENDUM A: Examples of tertiary musicians' health educational interventions

Several institutions which participated in the HPSM conference have offered programmes on musicians' health promotion, such as Berkeley College; Boston Conservatory; Francis Clark Center for Keyboard Pedagogy; Hardin Simmons University; Oberlin; Rutgers; University of California, San Francisco; University of Washington; and Western Michigan University (Pierce 2010:67). Moorehead State University offers various classes dealing with musicians' health issues, including a class called 'The Art of Performing', which focuses on performance psychology. The New England Conservatory offers diverse classes on wellness issues and has online health promotion resources. The musicians' wellness course 'Coordinate Movement' is run at Portland State University. Ithaca College holds regular 'Healthy Musician' workshops (Pierce 2010).

Manchester (2007a; 2007b; 2007c) describes various musicians' wellness courses at tertiary institutions in the United Kingdom, the United States (USA) and Europe. The 'Healthy Body, Healthy Mind, Healthy Music' programme at the Royal College of Music in London comprises ongoing AT classes, as well as a seminar series on musicians' health and wellbeing, including the physical aspects of performance, voice care, performance psychology, hearing protection, physical fitness and nutrition (Manchester 2007c:117; Williamon & Thompson 2006:426). Freiburg University has a mandatory injury prevention and health promotion course for their music students, which started in 2000 (Zander, Voltmer & Spahn 2010:55).

At Ohio University (OU) in Athens, Ohio, the course 'Performance Preparation' includes basic anatomy, physical fitness, body alignment, injury prevention, somatic practices, stress management and performance anxiety tools. The course is taught by OU and guest lecturers enabling input from various fields (Manchester 2007a: 26). Collaboration between the Music Department and School of Occupational Therapy at the University of Indianapolis, Indiana, enabled 'Health Promotion and Prevention of Injury for Musicians'. The programme is taught by an occupational therapist, who specialises in treating musicians. Content includes musicians' health problems, risk

factors, injury prevention, physical conditioning, nutrition, rest, stress, anxiety, and instrument and environment modifications (Manchester 2007a:27). In Denton, Texas, the University of North Texas (UNT) has various opportunities for health promotion education which are available through the UNT Texas Centre for Music and Medicine. The course 'Occupational Health: Lessons from Music' utilises a blended learning approach, with both online and lecturer-taught content, with modules covering musculoskeletal, hearing, mental and vocal health (Manchester 2007a:27).

The highly experiential course 'Keys to Healthy Music' at the Eastman School of Music, Rochester, New York, includes the background of musicians' health concerns, posture and alignment, physiology of movement, breathing, Body Mapping, anatomy, managing stress, self-massage, performance anxiety and its association with injury, ergonomics, practice skills, environmental concerns, stretching, strength training, lifestyle, musculoskeletal injuries, treatment, and somatic methods, such as Feldenkrais, Mensendieck, the Alexander Technique, yoga and martial arts (Manchester 2007a:29).

'The Complete Musician' at Shepherd University, West Virginia, includes education on practice approaches, relaxation methods, and injury prevention and management. Guest lecturers introduce the AT, the FM, biofeedback and yoga (Manchester 2007b:80). At the University of Southern Maine, Portland, Maine, a course is given by an occupational therapist in anatomy, biomechanics, alignment, breathing and muscular retraining, called 'Dynamic Posture and Alignment'. Students acquire both practical skills and conceptual knowledge for preventing musculoskeletal injury and pain, releasing tension, and optimising efficiency and freedom of movement (Manchester 2007b:80). 'Healthy Musicianship' at Michigan State University includes content on both the physical and psychological aspects of performance. Somatic methods, such as the AT and FM are incorporated, and the content covers neuromusculoskeletal health, hearing conservation, voice care and psychological aspects. Guest lecturers on the course are also part of the MSU Musician's Wellness Team (Palac 2015:29; Manchester 2007b:81).

At the George Mason University in Fairfax, Virginia, the course 'Arts of Teaching Music: Wellness Practices for Musicians' covers topics, such as risk factors, injury prevention, practice approaches, relaxation, stretching, AT, FM, performance psychology, wellness principles in teaching and lifestyle. The university's Centre for Arts and Wellness also hosts other activities, such as workshops by visiting specialists, master classes, musicians' health days and offers individual counselling for students (Manchester 2007c:116). The Institute of Music Physiology and Musicians' Medicine at the Hannover Institute of Music and Drama in Germany teaches music physiology and injury prevention, conducts research in music performance and music perception, and investigates the causes, prevention, diagnosis and treatment of musicians' occupational injuries. The courses offered address the anatomy and physiology of music performance, practice approaches, prevention of injury, pain syndromes, auditory system, hearing protection, and performance anxiety. Regular specialised seminars and individual consultations are offered, emphasising collaboration with studio teachers to achieve a fusion of pedagogical and physiological information. Individual and group sessions in the FM are available to all students (Manchester 2007c:118; Altenmüller 1999:5).

The "Sound Performers" project, created by the MHNCI in Australia is an online multimedia performance health curriculum for tertiary music students, which includes anatomy and performance biomechanics, breathing structures, auditory health, posture and ergonomics, risk factors for injury, rehabilitation guidelines, performance psychology, exercise and lifestyle (Wijsman 2012:6). It is innovative in that it can be disseminated widely for use in many music colleges; it combines multidisciplinary expertise; content is designed for relevance in a wide range of musical genres and is designed and built, using open-source software so that it can continue to be expanded and developed (Wijsman 2012:12). The Sibelius Academy in Helsinki, Finland, also runs an online musicians' health course for music students titled: "Do you know enough about playing practice?" which incorporates physiological and psychological aspects of practice and performance (Joukamo-Ampuja, Heiskanen, Arjas, Porander & Peltomaa 2009).

In Trondheim, Norway, Spaulding set up an interdisciplinary prevention programme in 1983 which is integrated into the curriculum (Spaulding 1988). The programme includes practical movement classes and lectures on physiology, posture, ergonomics, kinaesthetic training, relaxation, stress management, resilience, healthy practising, self-observation abilities, improvisation, self-care and lifestyle. The initial course for new incoming students is compulsory with subsequent coursework being elective. It is interesting that elective participation has yielded better results. The entry level course is primarily for evaluation and individualised direction. A fundamental pedagogical goal is to instil in the students an attitude of responsibility for their own health so that: “Prevention must become a skill of conscious awareness and habit, requiring time, practice, and constancy” (Spaulding 1988:136). The role of the studio teacher in supporting the student in prevention efforts is critical (Spaulding 1988:138).

Some educational interventions have focused more on the psychosocial aspects. McGrath (2012:95) describes the Eastman School of Music’s approach to student well-being, with a focus on students’ self-esteem, belief in self-efficacy, and stress tolerance. Components and programmes include psychological testing, identifying students who go unnoticed and withdraw due to lack of confidence and anxiety, the role of the teacher as mentor, performance psychology, reducing tension, relaxation skills and breathing awareness. According to McGrath (2012:98), “recognizing that the skills to approach the stage with confidence should be a collaborative effort between the student, teacher, and music school administration demonstrates an accountability many departments lack”.

An educational intervention, the ‘Performance Wellness Seminar’, developed by Louise Montello, empowering students with tools for performance mastery, increasing emotional intelligence and developing resilience was taught to university student musicians to help prevent performance-related disorders. The programme included breathing awareness training, relaxation techniques, joint mobilisation exercises, CBT strategies, mindfulness meditation, visualisation skills, behavioural rehearsal, assertiveness training and music therapy for musicians. This seminar is taught at

several music colleges and surveys report the students' increased joy and mastery in performance, as well as decreased fear (Montello 2010:114).

There are also existing models of musicians' health training for in-service music teachers, such as the self-sustaining mentor programme 'Healthy Music School' Schloss Kapfenburg (Mentorenausbildung 'Gesunde Musikschule' Schloss Kapfenburg). According to Thaele (2016:118), it is offered by the Freiburg Institute for music medicine together with the broader intervention 'Fit with Music! at the music school' (Fit mit Musik! an der Musikschule) and 'Healthy Music Schools' (Gesunde Musikschulen). A staff member at a music school attends mentor training and then runs workshops or awareness days at their school. The school can, subsequently, be awarded a certificate as a 'Healthy Music School'. There are incentives for further certificates and motivating other music schools to participate, resulting in further proliferation of the programme. Training includes content in musculoskeletal and movement anatomy relevant to musicians, somatic approaches, and psychological aspects and their interaction with physiological factors. The mentors are taught how to apply the information in both individual and group contexts, and how to collaborate with somatic and medical practitioners (Thaele 2016:118).

The University of Arts Berlin, the Hans Eisler University of Music Berlin, the University of Music, Theatre and Media Hannover, and the Kurt-Singer Institute for Music Physiology and Musicians' Health jointly offer the course 'Music Physiology in the Daily Life of the Artist' (Musikphysiologie im künstlerischen Alltag) for professional musicians, which is held over six weekends. The curriculum comprises the physiological and psychological aspects of performance, body awareness and movement training, practising and learning methods, stress management and performance coaching. Practical application of the material is emphasised and can be integrated into teaching and performing (Thaele 2016:121). A comprehensive qualification in music physiology is also available for professional musicians at the University of Arts in Zurich. According to Thaele (2016:124), "the structure of the programme allows participants to build on their knowledge, expertise and competences in successive years, without being bound to a three-year programme".

Education for medical professionals in musicians' PRMD is necessary (Kava et al. 2010:18). Chandler and Foster (1999:137) suggest that performing arts medicine should be included in the curricula of medical schools. The MSc or postgraduate Diploma in Performing Arts Medicine, for graduates from the health sciences, is offered at the University College London. The qualification aims to equip health professionals with the knowledge and skills to be able to treat performing artists more effectively (Thaele 2016:114; Bird & Macdonald 2013:422). The Performing Arts Medicine Masters Certificate is offered at Shenandoah University in Virginia, USA. Its goal is to train medical professionals in the diagnosis, treatment, prevention, and management of performance-related disorders of musicians, dancers and theatre performers, as well as to facilitate clinical research. Information on this programme was obtained at: https://www.su.edu/athletic-training/athletic-training-programs/performing-arts-medicine-certificate/ [accessed on 21 July 2017].

OCCUPATIONAL HEALTH FOR MUSICIANS

2nd semester 2014

A course in preventing injury, enhancing performance and promoting wellness

Lecturer: Bridget Rennie-Salonen

When: 2nd semester 2014
Duration: 13 weeks
Lectures: 2 hours per week

COURSE CONTENT

Common injuries: Prevention, management & recovery
Movement and posture awareness. Embodiment.
Somatic approaches: The Alexander Technique, Feldenkrais & Body Mapping
Movement, the senses and awareness
The core of the body & the places of balance: How to sit and stand free of tension
Whole body support for free arm movement.
The legs as dynamic support.
The movements and structures of breathing
Practical applications with instruments / voice
Understanding performance anxiety. Performance confidence tools
Practising: Healthy approaches to practising including mental strategies and rest
Hearing issues: Noise induced hearing loss and hearing protection

This course forms part of the lecturer's PhD research and will be offered at XXXXXXX this year as an ***optional extra*** for students who are interested. There is no course fee. Class size is limited to maximum 20 students, from which the study sample will be selected. *The course does NOT form part of the BMus degree / diploma programme at XXXXX.*

Each student in the study sample will have 2 individual consultations, as well as an interview with the researcher/lecturer before and after the course. All participating students will be required to write self-observation journals during the course and complete a questionnaire. There is no exam.

Interested students to please contact
Bridget Rennie-Salonen
0724799684 or bridget@bridgetrs.com

ADDENDUM C: THE PROSPECTIVE STUDENTS' INFORMATION FORM

OCCUPATIONAL HEALTH FOR MUSICIANS

2nd semester 2014

A course in preventing injury, enhancing performance and promoting wellness

Lecturer/researcher: Bridget Rennie-Salonen

PROSPECTIVE STUDENTS' INFORMATION

Thank you for expressing your interest in taking this course. Note that final selection of students will be done in April and students will be informed soon thereafter. The course will start in the week of 21 July.
Please complete the form and email to* bridget@bridgetrs.com *or leave the hard copy in the researcher's pigeonhole at the reception desk.

NAME	
STUDENT NUMBER	
AGE	
MALE/FEMALE	
DEGREE/DIPLOMA	
ACADEMIC YEAR	
VOICE/INSTRUMENT/S	
EMAIL ADDRESS	
CELL NUMBER	
Are you willing to be interviewed before and after the course?	
Are you willing to fill in a questionnaire before and after the course?	
Are you willing to write a self-observation journal during the course?	
Would you mind if the sessions were recorded?	
Will you be committed to attending the full course?	
What is your motivation for wanting to attend the course?	
Do you have any specific medical/tension/injury/performance related problem that hinders you from reaching your full potential as a musician?	

ADDENDUM D: THE INFORMED CONSENT FORM

Researcher:
Bridget Salonen

7 Richmond Road
Mowbray
7700
Cape Town

T: 021 6898502
M: 072 4799684

bridget@bridgetrs.com

Research Supervisor:
Dr Frelet de Villiers

Lecturer: Odeion School of Music
PO Box 339
Bloemfontein
9300

T: 051 4013151
M: 071 6434671

devilliersamf@ufs.ac.za

Date:

Dear Participant

RE: INFORMED CONSENT

I would like to invite you to take part in this research project:

Exploring tertiary music students' experiences of an occupational health course based on the Body Mapping approach

This study is about tertiary level preventative training in musicians' performance health with Body Mapping forming the somatic education component. We would like you to participate with us in this research because you are a student at XXXXXXXXXXXXXXXXXXX and you have expressed your interest in attending this optional course. The reason we are doing this study is to explore the value of musicians' occupational health coursework in the university training of musicians and the content thereof. There are no possible risks to you in taking part in this study. I am sure you will benefit from this study in terms of your musical learning and development.

This course forms part of my PhD research and will be offered as an ***optional extra*** for students who are interested. There is no course fee. Class size is limited to maximum 20 students, although only 6 students will form the study sample. The course does NOT form part of the BMus degree/diploma programme at XXXX. Each student of the 6 in the study sample will have 3 individual consultations, as well as an interview with the me before and after the course. Classes will be video-recorded and individual interviews will be audio-recorded. All participating students in the class will be required to write self-observation journals during the course and complete questionnaires.

While I greatly appreciate your participation in this important study and the valuable contribution you can make, your participation is entirely voluntary and you are under no obligation to take part in this study. If you do choose to take part, and an issue arises which makes you uncomfortable, you may at any time withdraw with no further repercussions.

In terms of research data, confidentiality and anonymity will be respected, and your name will not be used. Due to the small study sample of 6 students who will be selected for variety across different instruments/voice/genre, it may be possible for certain potential readers to connect, from the thesis, who some of the findings refer to. I will be sensitive to this issue and handle data with the utmost care, confidentiality and respect, consulting with a student where necessary, allowing the student to read and approve data gathered from his/her interview, obtaining their consent for its inclusion.

If you experience any discomfort or unhappiness with the way the research is being conducted, please feel free to contact me directly to discuss it, and also note that you are free to contact my study supervisor (indicated above). If you have questions about your rights as a research subject, you may contact:

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

Should any difficult personal issues arise during the course of this research, I will endeavour to see that a qualified expert is contacted and able to assist you.

Yours sincerely,

Bridget Salonen

Please fill in and return this page. Keep the letter above for future reference

---

Study: **Exploring tertiary music students' experiences of an occupational health course based on the Body Mapping approach**

Researcher: Bridget Salonen

Name and Surname: _____

Age: _____

Student number: _____

Academic year of study: _____

Degree/diploma: _____

Contact number: _____

- *I hereby give free and informed consent to participate in the abovementioned research study.*
- *I understand what the study is about, why I am participating and what the risks and benefits are.*
- *I give the researcher permission to make use of the data gathered from my participation, subject to the stipulations he/she has indicated in the above letter.*

Signature: _____ Date: _____

	Main questions	**PROMPTS/PROBES**
1	Can you tell me about your musical background?	What led you towards music and choosing your instrument/singing? How long have you been playing/ singing?
2	What does your music mean to you?	What are your favourite aspects of doing music? What are you goals and aspirations as a musician?
3	What are you aware of when you play/ sing?	How does it feel? What do you mostly think of?
4	Tell me about your decision to sign up for the course?	Why? What motivated you? What aspects are you interested in?
5	How are you feeling about your current technical and performance abilities and level?	Do you feel limited in any way? How? Are you able to practise productively and efficiently? In what way?
6	What do you think about artistry, embodiment, and expression as a performer?	How do you feel about those?
7	What are your expectations of the course?	What would you like to learn about in this course? How do you hope to benefit from the course?
8	Can you tell me about your physical comfort when you play/sing?	Do you have any discomfort or pain associated with playing? How do you feel after a practice session or performance? Tell me more about that? Tension levels?
9	How do you feel about the issue of musicians' performance related injuries?	What strategies do you know about for preventing injuries and enhancing performance in musicians? What are your strategies? How do you know about those?
10	How do you feel about your confidence as a musician and performer?	Have you experienced performance anxiety? What strategies do you know about which develop confident performance skills? What are your strategies for confident performance? How did you learn those?

	Main questions	PROMPTS/PROBES
1	Did this course meet your initial expectations?	Can you tell me more about that?
2	What were your impressions of the course?	What did you think about the course in general? Can you tell me more about your feelings and experiences during the course?
3	What are you aware of when you play/ sing?	Has this awareness changed since doing the course? How does it feel? What do you mostly think of while you play or sing?
4	How are you feeling about your current technical and performance abilities and level?	Tell me about your approach to practising? Have you noticed any changes in your technical facility? Did you notice any changes in your tone? Tell me more?
5	Can you tell me about your physical comfort when you play/sing now, since doing the course?	How did the course affect your physical health as a musician? Tension levels?
6	How do you feel about your confidence as a musician and performer?	Have you experienced performance anxiety? What are your strategies for confident performance?
7	How did you feel the course affect your musical and performance abilities?	Did you notice any changes? Tell me about any changes in artistry, embodiment, and expression as a performer?
8	How did you feel the course affect your psychological health and wellbeing?	What changes did you notice in your emotional / mental state? Attitudes?
9	Looking back over the course, what was your favourite section and why?	How did it make you feel? What did you enjoy the most? Can you tell me about your best experience during the course?
10	What have been the benefits of the course for you?	What aspects did you find useful? Can you tell me more about that?
11	Which part of the course did you find least helpful and why?	In what way? How did it make you feel?
12	Was there an aspect of the course that was stressful for you? If so, how?	Why? How did it make you feel? Tell me more?
13	Can you tell me about what you did not like in the course?	Why? Tell me more about that? How did it make you feel?
14	What did you think about Body Mapping?	What aspects of body awareness and movement as a musician were useful for you? What aspects were not helpful for you? Tell me more?
15	How do you feel about courses like this for music students in general?	Tell me more about that? In what way?

ADDENDUM F: BACKGROUND INFORMATION QUESTIONNAIRE

Background Information Questionnaire (Buchanan)

The information you provide on this questionnaire is confidential and will be used by the instructor for the purpose of designing and tailoring course content, selecting appropriate teaching techniques, and determining specific participant needs and issues through the course.

Name: _____ **Academic year level:** _____

Course: _____ **Instrument:** _____

1. Which performance skill (instrument, voice or conducting) will you focus on for your practical performance work in this course?

_____

2. Have you had any previous experience with any somatic approaches, i.e. Body Mapping, The Alexander Technique, The Feldenkrais Method, The Franklin Method? If yes indicate which ones and briefly explain.

_____

_____

_____

3. Have you ever suffered music playing-related injuries? If yes please list and explain any treatment.

_____

_____

_____

4. Have you ever experienced any limitations in your technical skills as a musician? If yes, specify.

_____

_____

_____

5. Can you identify any particular physical, musical, or personal (emotional, psychological) issue/s the instructor should be aware of or consider when working with you during this course? If yes, give appropriate details.

_____

_____

_____

6. Have you ever suffered from performance anxiety? If yes, briefly explain the form, severity and situations likely to induce it.

_____

_____

_____

7. Why did you choose to take *Occupational Health for Musicians* this semester?

_____

_____

_____

8. What is your primary goal for this class, i.e. what specific skill/s or issue/s do you wish to achieve/address/overcome by the end of the semester?

_____

_____

_____

Epidemiological Questionnaire for Music Students

(With acknowledgements: Ackermann 2010, Barton 2008, Spahn 2010)

The information you provide in this questionnaire is for research purposes only. Anonymity will be respected. The purpose is to give the researcher information as part of the research on students' experiences of the course: *Occupational Health for Musicians*. Thank you

1. Age in years	**years**
2. Gender	☐ Female ☐ Male
3. Height in cm	**cm**
4. Weight in kg	**kg**
5. Smoker?	☐ Yes ☐ No

☐ Never

☐ In the past ……cigarettes per day ……years smoked

☐ Yes ……cigarettes per day ……years smoked

6. Current Higher Music Education

Academic year of study			
Course	☐ Degree	☐ Diploma	☐ Other – Specify:
Level	☐ Undergraduate	☐ Postgraduate	
Focus	☐ Music education	☐ Music performance	☐ Other – Specify:
Genre	☐ Western Classical	☐ Jazz	☐ African Music
	☐ Opera	☐ Other – Specify:	

7. Instrument / voice /conducting

First instrument	
Second instrument For how many years have you been playing your primary instrument/singing?	
For how many years have you been taking formal lessons in your primary instrument/voice?	

8. Have you had previous instruction in occupational health for musicians?

☐ Yes ☐ No

9. Do you get regular physical exercise?

☐ Yes ☐ No

10. If your answer to question 9 is yes, specify details below:

Exercise Type	Sessions per week	Minutes per session
Jogging		
Cycling		
Gym exercise classes		
Gym weight training		
Swimming		
Yoga		
Pilates		
Walking		
Tennis		
Dancing		
Other		
Other		
Other		

11. Please estimate how many hours per week you spend doing fine work using your hands and fingers EXCLUDING instrumental playing. This includes activities such as computer work, handwriting, needlework, knitting, making models, computer games, and so on. Please describe up to five of any such activity, listing these in order from the most frequent, and the average weekly amount of time involved in hours.

Activity	Hours per week

12. Are you suffering from any complaints related to your activity as a musician which adversely affect your playing/singing/conducting?

☐ Yes ☐ No

13. If your answer to question 12 is yes, which of the following areas is affected?

☐ Mainly my physical state

☐ Mainly my psychological state

☐ Both my physical and psychological states

14. If your answer to question 12 is yes, how long have these complaints been lasting?

☐ Several days

☐ Several weeks

☐ Several months

☐ Several years

15. If your answer to question 12 is yes, how strongly was your playing/singing affected during the last seven days by the complaints?

☐ Playing is not affected

☐ Playing is affected slightly

☐ I try playing despite string symptoms

☐ Playing is affected strongly

☐ Playing is not possible

16. Did you ever take any of the following substances as a result of problems relating to your activity as a musician? (You may tick more than one answer)

☐ Painkiller/anti-inflammatory

☐ Tranquiliser

☐ Beta-Blocker

☐ Psychiatric medication

☐ Alcohol

☐ I prefer not to disclose

17. Are you currently doing anything to help PREVENT strain or injury as a musician?

☐ Yes ☐ No

18. If the answer to question 17 is yes, which of the following apply? (You may tick more than one answer)
☐ Exercise – specify:
☐ Relaxation techniques
☐ Somatic approaches (e.g. Alexander Technique, Feldenkrais, Body Mapping)
☐ Psychotherapeutic support (e.g. psychotherapy, counseling)
☐ Other – specify:
19. Have you had any previous surgery that may have an impact on your playing, singing or conducting?
☐ No ☐ Yes – specify:
20. Do you have any medical conditions that may have an impact on your playing, singing or conducting?
☐ No ☐ Yes – specify:

With acknowledgements:
Epidemiological Questionnaire for Musicians' – from: Zander M.F., E. Voltmer & C. Spahn. 2010. Health Promotion and Prevention in Higher Music Education – Results of a Longitudinal Study. *Medical Problems of Performing Artists* 25(2):54-65.
'Demographic Questionnaire' – from: Barton R. & J.R. Feinberg. 2008. Effectiveness of an educational program in health promotion and injury prevention for freshman music majors. *Medical Problems of Performing Artists* 23(2):47-53.
'Demographics and general exercise levels' – from: Ackermann, B.J. & Driscoll, T. 2010 Development of a new Instrument for measuring the musculoskeletal load and physical health of professional orchestral musicians. *Medical Problems of Performing Artists.* 25(3):95.

Physical Symptoms Profile

With acknowledgements to: Ackermann 2010, Ingle 2013 & Stanhope 2014

The information you provide in this questionnaire is for research purposes only.

Anonymity will be respected.

The purpose is to give the researcher information as part of the research on students' experiences of the course: *Occupational Health for Musicians*.

Thank you

1. **Please indicate how important you think it is for university music courses to include training in understanding of how your body works for performance. Circle the appropriate number.**

(0 = not important at all) 0 1 2 3 4 5 6 7 8 9 10 (10 = extremely important)

2. **Please circle the number that best describes your physical ability in the last week:**

Did you have any difficulty:	No difficulty	Mild difficulty	Moderate difficulty	Severe difficulty	Unable
Using you usual technique for playing, singing or conducting?	1	2	3	4	5
Playing, singing or conducting because of physical pain or discomfort?	1	2	3	4	5
Playing, singing or conducting as well as you would like?	1	2	3	4	5
Spending your usual amount of time practicing?	1	2	3	4	5

3. **Please rate your level of knowledge of the following topics as applied to music making:**
(Please circle the appropriate number)

Topic	**Effect of each subject on performance:** **0 = nil** **10 = greatest**
Posture	0 1 2 3 4 5 6 7 8 9 10
Movement and sensory awareness	0 1 2 3 4 5 6 7 8 9 10
The musician's body: relevant musculoskeletal anatomy	0 1 2 3 4 5 6 7 8 9 10
Performance psychology	0 1 2 3 4 5 6 7 8 9 10
Injury prevention & management	0 1 2 3 4 5 6 7 8 9 10
Healthy musicianship: practice habits and lifestyle	0 1 2 3 4 5 6 7 8 9 10

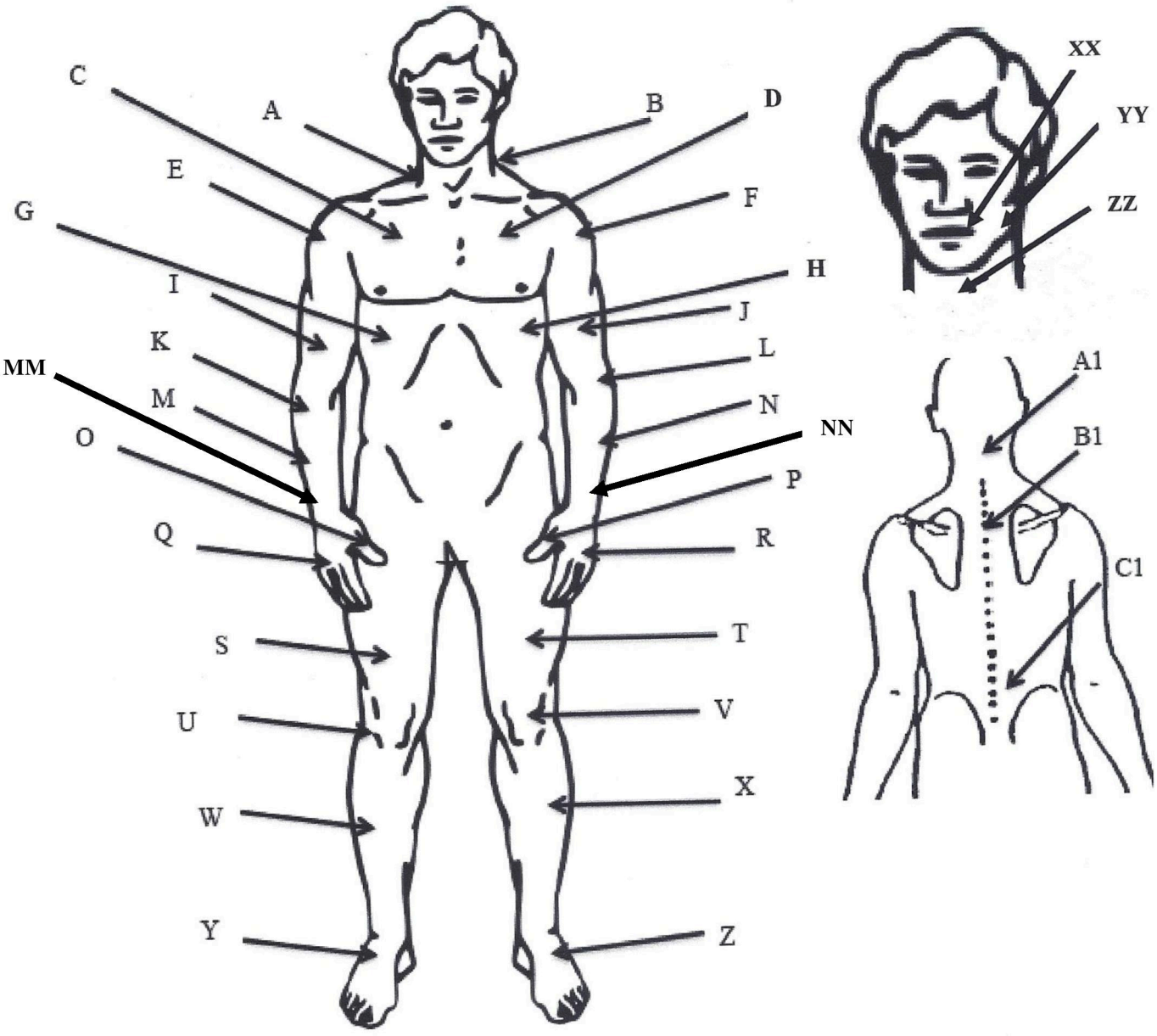
4. **How important do you regard the following topics in relation to how well you perform?**
(Please circle appropriate number)

Topic	**Effect of each subject on performance:** **0 = nil** **10=greatest**
Posture	0 1 2 3 4 5 6 7 8 9 10
Movement awareness and training	0 1 2 3 4 5 6 7 8 9 10
The musician's body: relevant musculoskeletal anatomy	0 1 2 3 4 5 6 7 8 9 10
Performance psychology	0 1 2 3 4 5 6 7 8 9 10
Injury prevention & management	0 1 2 3 4 5 6 7 8 9 10
Healthy musicianship: practice habits and lifestyle	0 1 2 3 4 5 6 7 8 9 10

5. **Do you *currently* suffer from discomfort, pain or injury related to playing your instrument, singing or conducting, that has been present for at least the past seven days?**

YES	NO

If yes, please indicate on the table on the next page using the letters from the body chart below.



Pain/injury location (letter from body chart e.g. E)	**Severity /10** 0 = no pain 10 = severe pain (Circle one answer)	**Duration** (Circle one answer)	**Consistency of pain** (Circle one answer)	**Caused by playing** (Circle one answer)	**Affecting playing** (Circle yes/no)	**Symptom description** (please circle all relevant answers)
	1 2 3 4 5 6 7 8 9 10	Less than 4 weeks 4-12 weeks More than 3 months	Constant Occasional	Yes No Don't know	Yes No	Aching sharp burning throbbing hot cramping pulling tingling numb cold shooting heavy weak tender tiring stiff uncoordinated *Other*.......... ....
	1 2 3 4 5 6 7 8 9 10	Less than 4 weeks 4-12 weeks More than 3 months	Constant Occasional	Yes No Don't know	Yes No	Aching sharp burning throbbing hot cramping pulling tingling numb cold shooting heavy weak tender tiring stiff uncoordinated *Other*........... ....
	1 2 3 4 5 6 7 8 9 10	Less than 4 weeks 4-12 weeks More than 3 months	Constant Occasional	Yes No Don't know	Yes No	Aching sharp burning throbbing hot cramping pulling tingling numb cold shooting heavy weak tender tiring stiff uncoordinated *Other*........... ....

A = Right neck B = Left neck C = Right chest D = Left chest E = Right shoulder F = Left shoulder G = Right ribs H = Left ribs I = Right arm J = Left arm K = Right elbow	L = Left elbow M = Right forearm N = Left forearm O = Right thumb P = Left thumb Q = Right hand/fingers R = Left hand/fingers S = Right thigh T = Left thigh U = Right knee V = Left knee	W = Right leg X = Left leg Y = Right foot/ankle/toes Z = Left foot/ankle/toes A1 = Upper spine B1 = Mid spine/shoulder blades C1 = Lower spine XX = Lips YY = Jaw/cheek ZZ = Throat MM = Right wrist NN = Left wrist

6. **How often do you suffer from discomfort, pain or injury related to playing your instrument, singing or conducting?**

(0 = never) 0 1 2 3 4 5 6 7 8 9 10 (10 = constantly)

7. **Below is a list of possible causes of discomfort, pain and/or injury for musicians. For *each* factor, please circle the number that best indicates how much you think that factor contributed to any pain or injury you have described above. Leave the row blank if not applicable**

Risk factor	**Effect on the Development of an Injury Related to Playing** **0 = no effect** **10 = greatest effect**
Long practice sessions	**0 1 2 3 4 5 6 7 8 9 10**
Insufficient rest/breaks	**0 1 2 3 4 5 6 7 8 9 10**
Sudden playing increase	**0 1 2 3 4 5 6 7 8 9 10**
Poor posture	**0 1 2 3 4 5 6 7 8 9 10**
Lack of fitness	**0 1 2 3 4 5 6 7 8 9 10**
Lack of flexibility	**0 1 2 3 4 5 6 7 8 9 10**
Lack of body awareness	**0 1 2 3 4 5 6 7 8 9 10**
Excess muscle tension	**0 1 2 3 4 5 6 7 8 9 10**
Muscle fatigue	**0 1 2 3 4 5 6 7 8 9 10**
Insufficient warm-up	**0 1 2 3 4 5 6 7 8 9 10**
Instrument set-up issue	**0 1 2 3 4 5 6 7 8 9 10**
Technical flaws	**0 1 2 3 4 5 6 7 8 9 10**
Performance anxiety	**0 1 2 3 4 5 6 7 8 9 10**
Stress	**0 1 2 3 4 5 6 7 8 9 10**
Poor injury management	**0 1 2 3 4 5 6 7 8 9 10**
Repertoire	**0 1 2 3 4 5 6 7 8 9 10**
Other:……	**0 1 2 3 4 5 6 7 8 9 10**

8. This question refers to your average daily practice time, including personal practice and rehearsals with other musicians.

How many days per week do you practice/rehearse?		days/week
How long is one average practice session?		minutes
How many practice sessions would you normally do per day?		sessions
What is the minimum length of time that you would rest for between practice sessions?		minutes
Do you use mental practice?	yes	no

9. Rate your agreement with the following statements:
('Injury' refers to musculoskeletal symptoms related to your activity as a musician, like pain, discomfort, tingling, numbness, or weakness)

	0 = completely disagree										10 = completely agree
Injury prevention is the responsibility of the teacher	0	1	2	3	4	5	6	7	8	9	10
Injury prevention is the responsibility of the individual musician	0	1	2	3	4	5	6	7	8	9	10
Injury prevention is the responsibility of the university	0	1	2	3	4	5	6	7	8	9	10
Injuries can be prevented	0	1	2	3	4	5	6	7	8	9	10
If I had an injury, I would tell my teacher	0	1	2	3	4	5	6	7	8	9	10
If a musician has an injury, it reflects poorly on their teacher	0	1	2	3	4	5	6	7	8	9	10
Musicians should understand injury prevention	0	1	2	3	4	5	6	7	8	9	10
Discomfort is a normal part of playing	0	1	2	3	4	5	6	7	8	9	10
Health professionals need a good musical understanding to advise and treat musicians	0	1	2	3	4	5	6	7	8	9	10
I would not tell another musician if I had an injury	0	1	2	3	4	5	6	7	8	9	10
Musicians who have had an injury are at higher risk of future injury	0	1	2	3	4	5	6	7	8	9	10
Musicians who have had an injury should not be professional musicians	0	1	2	3	4	5	6	7	8	9	10
Musicians who have had to have time off because of an injury must not want to be musicians badly enough.	0	1	2	3	4	5	6	7	8	9	10
Teachers should teach injury prevention	0	1	2	3	4	5	6	7	8	9	10
Injuries are an excuse for time off	0	1	2	3	4	5	6	7	8	9	10

With acknowledgements:

'Player pain/injury profile' from: Ackermann, B. & Driscoll, T. 2010 Development of a new instrument for measuring the musculoskeletal load and physical health of professional orchestral musicians. *Medical Problems of Performing Artists*. 25(3):95.

'Physical characteristics, health attitudes and symptoms questionnaire' – from: Ingle, M. 2013. *Evaluation of a trial of an e-health promotion course aimed at Australian tertiary music students*. Sydney: University of Sydney. (Unpublished thesis – MMus)

Survey from: Stanhope, J., Milanese, S. & Grimmer, K. 2014. University woodwind students' experiences with playing-related injuries and their management: a pilot study. *Journal of Pain Research.* 7:133.

ADDENDUM I: DASS 42

DASS

Name: *Date:*

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found myself getting upset by quite trivial things	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I just couldn't seem to get going	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I had a feeling of shakiness (eg, legs going to give way)	0	1	2	3
8	I found it difficult to relax	0	1	2	3
9	I found myself in situations that made me so anxious I was most relieved when they ended	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting upset rather easily	0	1	2	3
12	I felt that I was using a lot of nervous energy	0	1	2	3
13	I felt sad and depressed	0	1	2	3
14	I found myself getting impatient when I was delayed in any way (eg, lifts, traffic lights, being kept waiting)	0	1	2	3
15	I had a feeling of faintness	0	1	2	3
16	I felt that I had lost interest in just about everything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I perspired noticeably (eg, hands sweaty) in the absence of high temperatures or physical exertion	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life wasn't worthwhile	0	1	2	3

Please turn the page ☞

Reminder of rating scale:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

22	I found it hard to wind down	0	1	2	3
23	I had difficulty in swallowing	0	1	2	3
24	I couldn't seem to get any enjoyment out of the things I did	0	1	2	3
25	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
26	I felt down-hearted and blue	0	1	2	3
27	I found that I was very irritable	0	1	2	3
28	I felt I was close to panic	0	1	2	3
29	I found it hard to calm down after something upset me	0	1	2	3
30	I feared that I would be "thrown" by some trivial but unfamiliar task	0	1	2	3
31	I was unable to become enthusiastic about anything	0	1	2	3
32	I found it difficult to tolerate interruptions to what I was doing	0	1	2	3
33	I was in a state of nervous tension	0	1	2	3
34	I felt I was pretty worthless	0	1	2	3
35	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
36	I felt terrified	0	1	2	3
37	I could see nothing in the future to be hopeful about	0	1	2	3
38	I felt that life was meaningless	0	1	2	3
39	I found myself getting agitated	0	1	2	3
40	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
41	I experienced trembling (eg, in the hands)	0	1	2	3
42	I found it difficult to work up the initiative to do things	0	1	2	3

ADDENDUM J: MUSIC DEPARTMENT COURSE EVALUATION FORM

Which range of marks would you expect for **this** course? Below 50 / 50-65 / 65+ / 75+*

What is the approx. percentage of your attendance? 100 / 80 / 70 / 60 / 40 / 20

* Please ring the appropriate answer

Please tick the appropriate box.

		Strongly agree	Agree	Neutral	Disagree	Stronly disagree
1.	I put a lot of effort into this course					
2.	I know that if I needed extra help outside the lecture period, the lecturer would have found time to help me					
3.	The contents of the course are relevant to my development as a musican					
4.	My interest in the subject has grown as a result of this course					
5.	The lecturer is well prepared					
6.	The lecture atmosphere was pleasant					

Please add your comments on the following:
Which aspects of the course did you find the most valuable?_____

_____

_____

_____

Any other comments you would like to make? _____

_____

_____

ADDENDUM K:
POST-COURSE QUESTIONNAIRE FOR THE INSTRUMENTAL OR VOCAL TEACHER

Occupational Health for Musicians
Observations questionnaire for instrumental/vocal lecturer
Bridget Rennie-Salonen 2014

The information you provide in this questionnaire is for research purposes only. Anonymity will be respected. The purpose is to give the researcher information on your observations of your student during and after their attendance of the optional extra course: *Occupational Health for Musicians*. The 'Course Info Flyer' is attached for your reference. Thank you for your feedback and time spent.

Lecturer's name	
Student's name	

1. Did your student tell you that he/she was attending this course?

☐ Yes ☐ No

2. If the answer to question 1 was yes, did your student discuss the course content with you?

☐ Yes ☐ No

3. If the answer to question 2 was yes, did you observe your student starting to integrate what they were learning into their playing and into their attitudes to health, posture and awareness?

☐ Yes ☐ No

4. Do you feel comfortable with your student attending a course in which they explore areas of information which may influence their technical and musical development?

☐ Yes ☐ No

5. If no please explain briefly:

6. Was the course information ever a cause for concern, or did it interfere in your teaching of your student?

☐ Yes ☐ No

7. If yes please explain briefly:

8. Have you had any previous instruction in somatic approaches such as The Alexander technique, Feldenkrais, Body Mapping, the Franklin Method or Taubman Method?

☐ Yes ☐ No

9. If yes, indicate which ones and briefly explain:

10. Have you had any previous instruction in occupational health for musicians? (Performance health, injury prevention etc.)

☐ Yes ☐ No

11. If yes, please describe briefly what kind of instruction:

12. Did you notice any changes in your student towards the end of the course in terms of the following areas? If yes please explain briefly.

	Yes / No	
Posture		
Physical ease		
Tension		
Learning / progress		

Practising results		
Breathing		
Tone		
Technique		
Listening		
Musical Expression		
Confidence		
Self-awareness:		
Movement/ Co-ordination		
Self-observation		

Motivation		
Enjoyment		
Performance		

13. Do you have any other observations of comments you wish to add?
    If so, please use the space provided below.

ADDENDUM L: THE JOURNAL ASSIGNMENT

Journal assignment: Bridget Rennie-Salonen

You may use this format as a guideline or you may write a paragraph in your own style

F	Feel	What you notice / observe / feel / are aware of (sensory/physical awareness)
E	Evaluate	Evaluate / explain what you think could be happening / a BMG explanation perhaps
E	Experiment	Possible solution / something that you try in order to improve / adjust
L	Learn	What you have learnt / you observe, notice and feel the result / are there any changes?

The objective here is for you to develop your awareness and to be able to start integrating some of the concepts you are learning about Body Mapping, movement and releasing tension. It is not about right and wrong, but about how you understand what you have learnt, start applying it, and then writing a clear journal tracking your experiences, developing kinesthetic awareness and developing your self-observation. Remember that things take time and be gentle, gradual and patient.

You will **email me 1 per week**.

Based on "OTHEO" scientific format:

O	Observation	what you observe, notice, feel
T	Theory	what you think could be happening / a BMG explanation perhaps /speculation / idea
H	Hypothesis	your proposal / tentative/suggested explanation / possible solution
E	Experiment	Something that you try to confirm hypothesis
O	Observation	You notice and evaluate the result / any changes

OTHEO example

O: I felt a sharp pain in my back while playing my viola.
T: My back was hurting because I felt tense - probably from how I was holding up my viola.
H: What would happen if I tried to let the muscles go that were hurting?
E: I tried to release the muscles and relaxed my stance.
O: Turned out that I was trying to hold my viola up too high. So my left shoulder was raised to keep the instrument up on my shoulder, while my head was leaning down to keep the chin on the chin rest. My right shoulder was raised to try to keep the bow on the strings. After relaxing it didn't hurt as much, but I need to figure out how to hold up my instrument in a way that won't hurt my back, but won't make me slouch at the same time.

FEEL example

F My knees feel "heavy" and weighted when I walk.

E When I was made aware that I had locked my knees when I walked, I overcompensated by bending my knees too much, forcing them out of line with my other points of balance.

E If I bend my knees only as much as possible, they will no longer feel weighted. I locked my knees and then bent them just enough to release my knee joints. I then tried to walk while adjusting to this new kinesthetic sensation. After doing this for a short while, I was able to develop a more accurate and adequate sense of what walking should feel like when my knees are properly released.

L I now felt my knees in the context of my whole body when I walked rather than feeling them as comparatively "heavy" to the rest of my moving parts.

ADDENDUM M: ETHICAL CLEARANCE LETTER UFS

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA
UFS·UV
HUMANITIES
GEESTESWETENSKAPPE

16 May 2014

Mrs B. Salonen
Odeion School of Music
UFS

Ethical Clearance Application: Exploring tertiary music students' experiences of an occupational health course based on the Body Mapping approach

Dear Mrs Salonen

With reference to your application for ethical clearance with the Faculty of the Humanities, I am pleased to inform you on behalf of the Ethics Board of the faculty that you have been granted ethical clearance for your research with the following stipulation:

- XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
- The consent form needs adjustment - it does not indicate that there will be video or any other recordings.
- There could be some problems given that all students know one another in the class and they will know (or soon find out) who the six are taking part in the study. Also, given that the six students will also be selected for variety across different instruments it will probably be quite easy to pick out and connect, from the thesis, who (at least some of the) findings refer to. All this is rather unavoidable, but should be part of the information contained in the letter of informed consent
- If video recordings are made for the purposes of the research, how will students who are not participating be implicated? It may be difficult to video some and not others without the process of videoing being quite intrusive and potentially altering the way participants move? Should permission be requested from all students irrespective of whether or not they participate?
- How will the researcher manage her subjectivity – seeing as she will be interviewing and consulting students who she teaches, attending a course she designs, and seeing as she is clearly in favour of occupational health training—all of which potentially bias her towards positive findings on the course?
- The applicant makes use of a variety of questionnaires but intends to do a phenomenological study. No mention is made of the analysis of the quantitative component of the research.

Your ethical clearance number, to be used in all correspondence, is:

UFS-HUM-2013-31

This ethical clearance number is valid for research conducted for one year from issuance. Should you require more time to complete this research, please apply for an extension in writing.

We request that any changes that may take place during the course of your research project be submitted in writing to the ethics office to ensure we are kept up to date with your progress and any ethical implications that may arise.

Kantoor van die Dekaan
Office of the Dean
Ofisa ya Dine

T: +27(0)514012240
F: +27(0)51401 7363
E: beukeshs@ufs.ac.za

P.O. Box/Posbus 339
Bloemfontein 9300
South Africa/Suid-Afrika
www.ufs.ac.za

Thank you for submitting this proposal for ethical clearance and we wish you every success with your research.

Yours sincerely,

Katinka de Wet
Research Ethics Committee (Faculty of the Humanities)

Copy: Ms Charné Vercueil (Research Co-ordinator, Faculty of the Humanities)

Kantoor van die Dekaan
Office of the Dean
Ofisa ya Dine

T: +27(0)514012240
F: +27(0)51401 7363
E: beukeshs@ufs.ac.za

P.O. Box/Posbus 339
Bloemfontein 9300
South Africa/Suid-Afrika
www.ufs.ac.za

ADDENDUM N: ETHICAL CLEARANCE LETTER UCT

[redacted]

Ref. No.: HUMREC201406-01

10th June 2014

Ms Bridget Salonen
[redacted]

Dear Ms Salonen

I am pleased to inform you that ethical clearance has been granted by an Ethics Review Committee of the Faculty of Humanities for your study, 'Exploring tertiary music students' experiences of an occupational health course based on the Body Mapping approach'.

I wish you all the best with your study.

Yours sincerely,

[redacted]
Chair, Humanities Faculty Research Ethics Committee

ADDENDUM O: COURSE ATTENDANCE REGISTER

REGISTER (Total students in class: 19)

	1	2	3	4	5	6	7	8	9	10	11	12	13
	23/7	30/7	6/8	13/8	20/8	27/8	10/9	17/9	1/10	8/10	15/10 moved to18/10	22/10	29/10 or 5/11
Attendance total	18	19	15	17	17	14	17	12	11	9	9	8	17
Name No.of lectures attended % attended **Shaded: 12 IPA sample**	12 sample students play/sing 5min pre-course video Pre-course questionnaires Meet & intro	Common injuries: Risk factors, Prevention, education, management & recovery	Movement, the senses & awareness, Somatic approaches.(Alexander Tech, Feldenkrais, etc) Body Mapping intro	The core of the body & the places of balance: How to sit and stand free of tension	Breathe with Ease: The movements and structures of breathing	Arms and legs: Whole body support for free arm movement. The legs as dynamic support.	Alexander Technique Workshop – Ingrid Weideman	Understanding performance anxiety. Performance confidence tools	Productive practising: Healthy approaches to practising including mental strategies and rest	Practical applications with instruments / voice (masterclass)	Practical applications with instruments / voice (masterclass)	Hearing issues: Noise induced hearing loss and hearing protection	12 sample students play/sing 5min post-course video Post-course questionnaires Closing & thanks
AO (9) 69%	✓	✓	abs	✓	✓	abs	✓	abs	✓	✓	✓	abs	✓
MANDLA (11) 85%	✓	✓	✓	✓	✓	✓	✓	✓	abs exc	✓	✓	abs ecx	✓
KHANYI (11) 85%	✓	✓	✓	abs	✓	✓	✓	✓	✓	✓	abs exc	✓	✓
DC (5) 38%	✓	✓	✓	✓	abs	abs	abs	abs	abs	abs	abs	abs	✓
MALIKA (8) 62%	✓	✓	✓	✓	✓	✓	✓	abs	abs	abs	abs	abs	✓
WILLEM (10) 77%	✓	✓	abs exc	✓	✓	✓	✓	✓	abs exc	✓	abs exc	✓	✓
JOLENE (12) 92%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	abs exc	✓
WENDY (11) 85%	✓	✓	✓	✓	✓	✓	✓	✓	abs exc	✓	abs exc	✓	✓
FRANK (13) 100%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MH (3) 23%	✓	✓	✓	Requested to withdraw due to her workload and full schedule									
GABRIELLE (10) 77%	✓	✓	✓	✓	✓	abs	✓	abs exc	✓	✓	✓	abs	✓

BONGI (12) 92%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	abs exc	✓
JAYDEN (12) 92%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	abs	✓	✓
MAX (12) 92%	✓	✓	abs exc	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SN (8) 62%	✓	✓	abs	✓	✓	✓	✓	✓	abs	abs	abs	abs	✓
TM (6) 46%	✓	✓	✓ late	✓	✓	abs	✓	abs	abs	abs	abs	abs	abs
TD (11) 85%	abs exc	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	abs	✓
DOROTHY (13) 100%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
XM (10) 77%	✓	✓	✓	✓	✓	✓	✓	abs	✓	abs	abs	✓	✓

% attendance

2 students attended 100% of the course

6 students attended 92% or more of the course

10 students attended 85% or more of the course

16 students attended 62% or more of the course

13 students attended 77% or more of the course

The 3 students whose attendance was less than 50%, had been sent by their teachers so were not intrinsically motivated to be there.

ADDENDUM P:

ANDOVER EDUCATOR LICENSURE CERTIFICATE 2010: BRIDGET RENNIE-SALONEN

ANDOVER EDUCATORS®

Teaching the Art of Movement in Music®

ANDOVER EDUCATORS HAS IDENTIFIED A PROFOUND NEED AMONG MUSICIANS FOR ACCURATE INFORMATION ABOUT THE BODY SO MUSICIANS MAY PLAY FREE OF PAIN AND INJURY AND WITH INCREASED ENJOYMENT AND SKILL. ANDOVER EDUCATORS HAS DEVELOPED A PROGRAM OF INSTRUCTION TO MEET THIS NEED:

IT IS HEREBY ACKNOWLEDGED THAT

Bridget Rennie-Salonen

HAS SUCCESSFULLY FULFILLED THE REQUIREMENTS FOR LICENSURE AS AN ANDOVER EDUCATOR, AND IS APPROVED TO PRESENT THE COURSE OF INSTRUCTION

What Every Musician Needs to Know About the Body®

PRESIDENT, ANDOVER EDUCATORS

2010

DATE

ADDENDUM Q: THEMES TABLE: CODES TO FINAL THEMATIC STRUCTURE

PRE-COURSE		
Original code names	**Subordinate themes**	**Superordinate themes**
Meaning of music / Preferences & aspirations / Reasons for doing music	Meaningful musical identity sets the scene	**Panorama**
Motivation for course / Somatic approaches / Opinions musicians' health	Eager for preventative knowledge and skills	
Whole body	Whole body a-synchrony	**Physical awareness**
Tension	Tension that debilitates	
Posture, balance, movement	Postural and movement challenges	
Physical comfort/discomfort / injury prevention	Limited by physical discomfort	
Breathing	Seeking freer breathing	
Spatial & sensory inclusivity	Disconnected sensory and spatial awareness	
Psychological: General aspects / Attitude: self-critical/constructive	Attitudes	**Psychological awareness**
Performance confidence / enjoyment / anxiety	Music performance anxiety: Debilitative & facilitative	
Preparation: Efficiency / methods / attitude / technique	Inconsistent practice	**Musicianship**
Musical embodiment & artistry	Musical dis-embodiment	

POST-COURSE		
Original code names	**Subordinate themes**	**Superordinate themes**
General impressions & benefits	Integrating valuable tools and broader understanding	**Panorama**
Group support & learning	Enabling perspective & compassion through group diversity	
Somatic approaches: Body Mapping	Body Mapping	
Duration & scheduling / Practical vs theory / Assignments / AT / Stressful / Dislike / Highlights	Course appraisal commentary	
Whole body	The whole me	**Physical awareness**
Tension	Appropriate tension release	
Posture, balance, movement	Postural and movement choices	
Physical comfort / discomfort / injury prevention	Physical ease	
Breathing	Embodied breathing awareness	
Spatial & sensory inclusivity	Auditory, kinaesthetic, and spatial integration	
Psychological: General aspects / Attitude: self-critical/constructive	Self-evaluation capacity and constructive acceptance	**Psychological awareness**
Performance confidence / enjoyment / anxiety	Performance confidence and enjoyment	
Preparation: Efficiency / methods / attitude/ technique / Empowerment/independence	Productive practice	**Musicianship**
Musical embodiment & artistry	Musical embodiment	

Superordinate themes	*Final subordinate themes (combined from pre- and post-course)*	*Pre-course subordinate themes*	*Post-course subordinate themes*
Panorama	Meaningful musical identity sets the scene	Meaningful musical identity sets the scene	~
	Eager for preventative knowledge and skills	Eager for preventative knowledge and skills	~
	Integrating valuable tools & broader understanding	~	Integrating valuable tools & broader understanding
	Enabling perspective & compassion through group diversity	~	Enabling perspective & compassion through group diversity
	Body Mapping opened my mind to my body	~	Body Mapping opened my mind to my body
	Course appraisal commentary	~	Course appraisal commentary
Physical awareness	The whole me	Whole body a-synchrony	The whole me
	Appropriate tension release	Tension that debilitates	Appropriate tension release
	Postural and movement choices	Postural & movement challenges	Postural and movement choices
	Physical ease and freedom	Limited by physical discomfort	Physical ease
	Allowing myself to breathe	Seeking freer breathing	Embodied breathing awareness
	Auditory, kinaesthetic, and spatial integration	Disconnected sensory & spatial awareness	Auditory, kinaesthetic, & spatial integration
Psychological awareness	Attitudes	Attitudes	~
	Self-evaluation capacity and constructive acceptance	~	Self-evaluation capacity & constructive acceptance
	Performance anxiety: Debilitative and facilitative	Music performance anxiety: Debilitative / facilitative	~
	Performance confidence and enjoyment	~	Performance confidence & enjoyment
Musicianship	Inconsistent practice	Inconsistent practice	~
	Productive practice	~	Productive practice
	Musical dis-embodiment	Musical dis-embodiment	~
	Musical embodiment	~	Musical embodiment