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# Return to Sport after Injury: The relationship between an athlete's type of motivation and a recurrence of injury

A dissertation by

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STUDY LEADER:
Dr. C. Brandt

# DECLARATION

I, Johan Human, certify that the report hereby submitted for the degree M.Sc.Physiotherapy at the University of the Free State is my independent effort and had not previously been submitted for a degree at another university/faculty. I furthermore waive copyright of the report in favour of the University of the Free State.

_____ 13 February 2017

Johan Human
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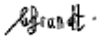
I, Dr. C. Brandt, approve submission of this dissertation for the M.Sc.Physiotherapy degree at the University of the Free State. I further declare that this dissertation has not been submitted as a whole or partially for examination before.

 13 February 2017

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***TO GOD BE THE GLORY***

# Abstract

Dr. C. Brandt; Johan Human

**Return to Sport after Injury: The relationship between an athlete's type of motivation and a recurrence of injury**

**Introduction and goal**

Development of the decision-based return to sport model attempts to address a lack of objective criteria in the literature to determine an athlete's readiness to return to sport (Creighton, Shrier, Shultz, Meeuwisse and Matheson. 2010). The model reveals motivational factors that may modify complex return to sport decisions, often the responsibility of physiotherapists. An athlete with extrinsic motivation to return to sport may persuade the physiotherapist and/or coach to return to sport too soon which may lead to the athlete being re-injured. The aim of this study was to establish coaches' expectations from physiotherapists regarding motivational factors for athletes to return to sport, athletes' type of motivation to return to sport, and a relation to recurrence of injury.

**Methodology**

A descriptive and cohort-analytical design were used to collect quantitative data from two populations. Six track and field coaches of elite athletes older than 18 years, participated in structured interviews. The data collected with the structured interviews included the coaches' expectations and views with regards to physiotherapists' role in return to sport decisions. Fifteen injured elite athletes, older than 18 years, returning to sport after injury were tested with an adapted revised sport motivation scale to determine their type of motivation to return to sport and follow-up phone calls were used to determine if their return to sport was successful.

**Results**

Coaches were of the opinion that their elite athletes often return to sport too soon due to pressure from persons, sponsors or institutions and indicated that a recommendation regarding the type of motivation of an athlete to RTS will

be of value. The Kruskal-Wallis test and Wilcoxon two sample test indicated that type of motivation was not found to statistically influence injury recurrence.

**Summary**

Although higher scores for extrinsic types of motivation was not found to statistically influence injury recurrence for elite track and field athletes in Bloemfontein, the noted trend of higher scores in these types of motivation needs further investigation on larger populations from different ages and types of sport. Track and field coaches of these athletes were of the opinion that their athletes often return to sport too soon due to motivational factors and did mention that they would value input from physiotherapists regarding motivational factors prevalent in their athletes that may cause further harm. Physiotherapists who cleared an elite athlete for return to sport based on the decision-based return to sport model, could modify their decisions and referral to an appropriate healthcare professional could benefit the athlete with a successful return to sport.

## List of abbreviations

| | |
|---|---|
| AFS | Athletics Free State |
| ASA | Athletics South Africa |
| BRSQ | Behavioural Regulation in Sport Questionnaire |
| CECS | Coaches Education and Certification System |
| CT-scans | Computed Tomography-scans |
| IAAF | International Association of Athletics Federations |
| I-PRRS | Injury-Psychological Readiness to Return to Sport |
| KOOS | Knee injury and Osteoarthritis Outcome Score |
| MRI | Magnetic Resonance Imaging |
| ROM | Range of motion |
| RTS | Return to sport |
| SD | Standard Deviation |
| SDT | Self-determination theory |
| SMS | Sport Motivation Scale |
| SMS-II | Revised Sport Motivation Scale |
| UFS | University of the Free State |
| USSA-athletics | University Sport South Africa – athletics |

## List of terminology

**Decision modifiers:** Factors that may influence the decision about an athlete's return-to-sport when the athlete has been cleared for return-to-sport based on medical factors and sport risks e.g. financial conflict of interest. (Creighton *et al*. 2010)

**Intrinsic motivation**: *Intrinsic motivation* is to perform an activity for the inherent satisfaction of performing the activity (Ryan and Deci 2000).

**Extrinsic motivation**: Extrinsic *motivation* is when the type of behaviour expressed is driven by the satisfaction of an external demand/reward (Ryan and Deci 2000).

**Return to sport**: Return to participation in sport after recovering from an injury (Creighton *et.al*. 2010).

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## *FOREWORD*

*Despite having suffered a Grade 1 tear of his hamstring muscle only six weeks earlier, 29-year-old Usain Bolt from Jamaica had fans on the edge of their seats when he lined up for the final in the 100m final event at the 2016 Rio Olympic Games (Perry 2016). Bolt had only six weeks from sustaining an injury until returning to top-level competition, yet he had a successful return to sport (RTS) and did not only win his gold medal in the 100m, but completed a never-before accomplished triple-treble gold medal tally by also winning his eighth and ninth gold medals at the Olympic Games of Rio 2016 (Ingle 2016).*

*The 29-year-old Australian hurdler, Sally Pearson, also sustained a hamstring tear seven weeks prior to the same Olympic Games. Pearson had won silver at the Beijing Olympic Games in 2008 and gold at the Olympic Games in London 2012. Pearson, however, returned to competition in Europe after fracturing and dislocating her left wrist 12 months earlier during a fall on the track. Valente (2016) reported that Pearson was struggling to retain her form on her RTS and also complained of a niggly hamstring during the European meetings. Pearson returned to Australia to work on her speed in preparation for the Olympic Games and tore her hamstring during training. Unlike Bolt, Pearson decided to withdraw from the Olympic Games in Rio (Valente 2016).*

*These examples illustrate how two prior Olympic champions with similar circumstances regarding participation at the Olympic Games made different decisions on RTS and accordingly, recorded significantly different outcomes.*

*~ The researcher*

# *Chapter 1*
# INTRODUCTION AND BACKGROUND

## 1.1 Introduction

This chapter provides introductory information about RTS after injury and the relationship between an athlete's type of motivation and a recurrence of injury.

Decisions regarding RTS and the complex nature thereof are well-known to physiotherapists working with elite athletes (Burgess 2011). Political leaders expect exceptional performances from the athletes selected to represent the country at international events, "We do not like losers; our team has done us proud..." according to the South African Minister of Sport, on welcoming the South African team back from the 2016 Olympic Games (Wagner 2016).

Slobounov (2011) mentions that enormous extrinsic pressure is placed on injured athletes to return to participation in sport as soon as possible. Sponsors expect decent coverage in print and broadcast media when sponsored athletes perform at competitions, in exchange for financial support. Coaches expect performances and titles to satisfy their employers. Spectators expect value for their money when they support athletes (Slobounov 2011). Burgess (2011) warns that development in the medical field and effective rehabilitation cannot keep up with the increasing demands on athletes to RTS faster and continually perform better.

Physiotherapists are first-line practitioners and are often responsible for making decisions regarding RTS (South African Society of Physiotherapy 2012). There is a definite lack of objective criteria for the physiotherapist to determine the athlete's readiness to RTS (Millson 2015). An extensive literature search revealed few books, journals and web pages reporting on the objective criteria specifically related to RTS. Search engines such as Google and Medline were searched using key words on their own and in different combinations. Key words included, "*objective, criteria, RTP, RTS,*

*return to play, psychological, modifiers, sport, ethics, guidelines, extrinsic, intrinsic, motivation, re-injury, self-determination theory*". The fourth bi-annual sport physiotherapy congress presented opportunities to attend presentations by international experts such as Barb Hoogenboom (involved with the development of the Y-test for RTS) and Helen Millson (expert on medico-legal issues and RTS) (Hoogenboom 2015, Millson 2010, Millson 2015a and Millson 2015b). The search was complemented by personal interviews and electronic communication with such experts on RTS.

The literature highlights the lack of research and this lack of objective criteria served as motivation for the development of the decision-based return to sport model developed and proposed by Creighton *et al*. (2010). Matheson, Shultz, Bido, Mitten, Meeuwisse and Shrier (2011) conducted a review on the available literature specific to the factors and components of this model and concluded that insufficient literature exists on the factors included in the model. This lack of literature serves as motivation for further research. Chapter 1 provides the background for this research study (refer to Figure 1.1).

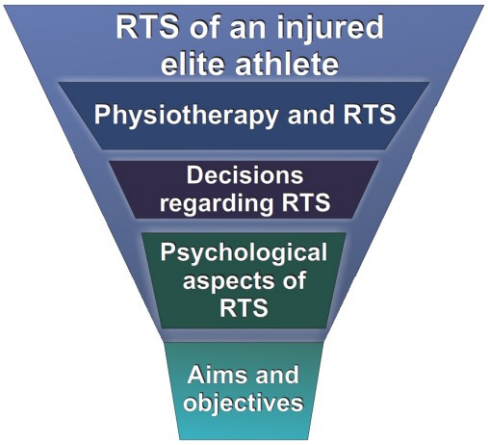


***Figure 1.1 Background for this research study***

## 1.2 Physiotherapy and RTS

Authors consider physiotherapists to be imperative participants in the athlete's physical, emotional and psychological healing (Tracey 2008; Le Roux in Sutcliffe 2005). Professional coaches from various sporting codes expect physiotherapists and medical practitioners to give the go-ahead for RTS after an injury (Podlog and Eklund 2007). Guidance on the amount and extent of training allowed for the specific athlete is also expected from the medical practitioner/physiotherapist by these coaches (Podlog and Eklund 2007). Physiotherapists should always pursue beneficence when they guide and assist coaches with the process of returning an athlete to sport, but Burgess (2011) warns that the application of beneficence might be complex. According to Burgess (2011), the principle of beneficence might be in conflict with the autonomy and self-determination of an athlete who wants to RTS. The athlete might consequently RTS too soon and subsequently, increase the risk for re-injury (Slobounov 2008; Creighton, Shrier, Shults, Meeuwisse and Matheson 2010; Hoogenboom 2015).

## 1.3 Decisions regarding RTS

Premature RTS based on the clearance of symptoms as the only measure, places the athlete in a position of high risk for re-injury, but also in a position for development of permanent psychological trauma (Slobounov 2011). The need to address the physical as well as the psychological aspects of an injury is widely recognised (Podlog, Dimmock and Miller in Burgess 2011).

There is a need for objective criteria for RTS decisions (Millson 2015). Myer, Paterno, Ford, Quatman and Hewett (2006) also identified a lack of standardised objective criteria to assist with assessment of an athlete's ability to safe RTS. The possible conflict between beneficence and autonomy of an athlete (refer to 1.2) also highlights the importance for physiotherapists to stay objective with decisions regarding RTS, but emotional involvement in the success of an athlete and pressure from various extrinsic sources may lead

the physiotherapist to subjectivity (Johnson in Burgess 2011; Brukner and Khan 2008).

The need for objective criteria motivated Creighton *et al.* (2010) to develop a three-step decision based model (refer to Figure 1.2) to simplify decisions regarding RTS and they indicated that the model should serve as a basis for further research on each of the individual factors and components of the model. The research would be integrated to serve as an evidence-based rationale for decisions regarding RTS.

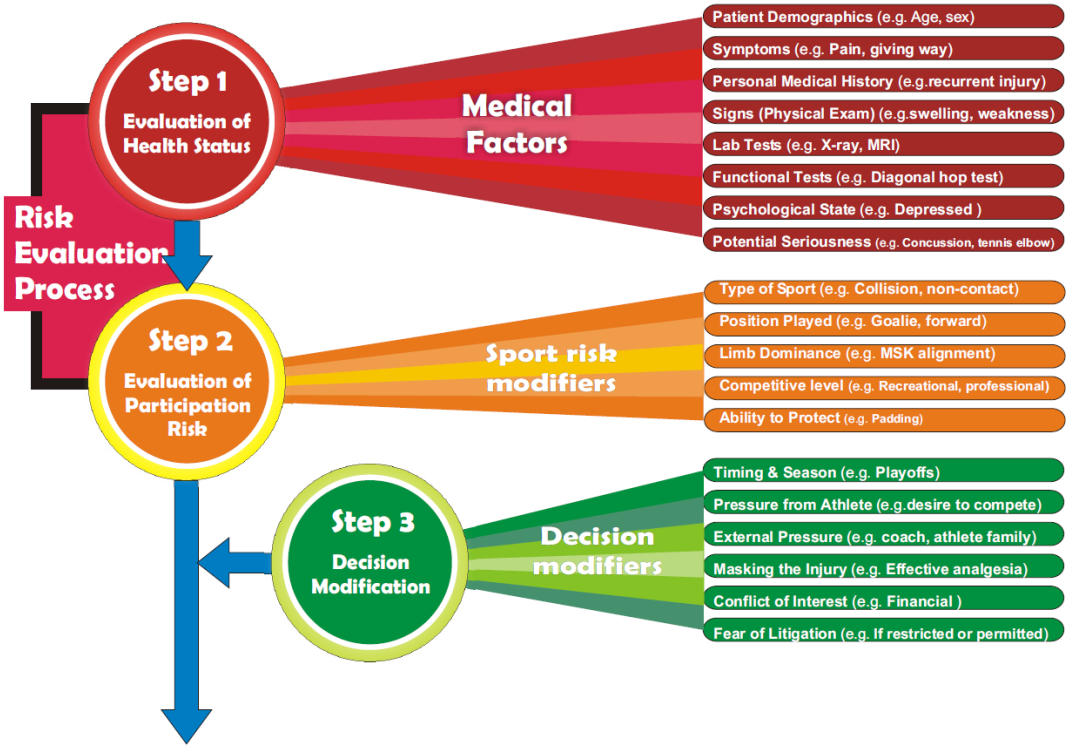


***Figure 1.2 Decision Based RTS Model (Creighton et al. 2010)***

The three steps and the factors of each step are discussed and explained in 2.6.

Matheson *et al*. (2011) conducted a review on the available literature specific to the factors and components of the model. They highlighted the need for more research on all the factors and components of the model but specifically,

research on the steps concerned with Sport Risk Modifiers and Decision Modifiers.

## 1.4 Psychological aspects of RTS

Burgess (2011) is of the opinion that large financial rewards and increasing media attention play a role in the fact that there are higher demands on athletes to perform better all the time. These higher expectations create intrinsic as well as extrinsic motivations to RTS after an injury (Kreiner-Phillips and Orlick 1993). According to the self-determination theory (SDT), which is a theory of motivation, personality and optimal functioning, motivations can range on a continuum which includes amotivation, intrinsic and extrinsic motivation (Podlog and Eklund 2010; Tran 2014). The SDT may be considered a valuable approach for coaches assisting athletes to RTS after an injury (Podlog and Dionigi 2010). Podlog and Eklund (2007) explained that the motivation of an athlete to RTS might play an important role in perceptions among elite and sub-elite athletes. An athlete with a positive view on RTS will engage in activities and rehabilitation programmes in order to have a more successful RTS. In contrast, an athlete with extrinsic motivation and a negative view on RTS might not participate fully in the rehabilitation program and consequently, may have a less successful RTS (Podlog and Eklund 2007). The decision modifiers illustrated in Figure 1.2 also include *pressure from the athlete* and *external pressure* that are examples of intrinsic and extrinsic motivation.

## 1.5 Research problem

Podlog and Eklund (2010) suggested that due to the lack of research on the type of motivation of an athlete who RTS and related objective outcomes, more research is needed on the type of motivation and relevant objective outcomes. Firstly, the dependence of coaches on physiotherapists for assistance regarding RTS-decisions and secondly, the need for more research expressed by Podlog and Eklund (2010), served as motivation to conduct this study.

## 1.6 Aim and objectives of this study

The study aimed to establish an athlete's type of motivation to RTS and a relation to the incidence of re-injury.

### 1.6.1 Objectives:

1.6.1.1 To determine track and field coaches' viewpoint on how motivational factors should be considered by physiotherapists in decisions regarding RTS by means of a structured interview,

1.6.1.2 to investigate the type of motivation of athletes on RTS by means of an adapted version of the Sport Motivation Scale II (SMS-II),

1.6.1.3 to determine subsequent re-injury of the athletes by means of an injury report form (Matheson *et al* 2012),

1.6.1.4 to compare the scores of the adapted SMS-II on the type of motivation, between athletes that were re-injured and those who were not.

## 1.7 Addressing the research problem

Literature indicated a need for research on objective criteria in order to develop a model for RTS decisions. The type of motivation of an athlete to RTS might play an important role in RTS decisions. Literature indicated a lack of research on the type of motivation of an athlete to RTS and subsequent objective outcomes (Podlog and Eklund 2007).

## 1.8 Outline of the thesis

The first chapter describes the complexities of RTS decisions as concerns an elite athlete. The role of physiotherapists in RTS decisions, the lack of objective criteria supporting these decisions and the psychological aspects

regarding RTS led to the aims and objectives of this study (refer to Figure 1.1). The interrelated discussions of concepts in the first two chapters and the resulting infiltration of these discussions into the study are illustrated in Figure 1.3.

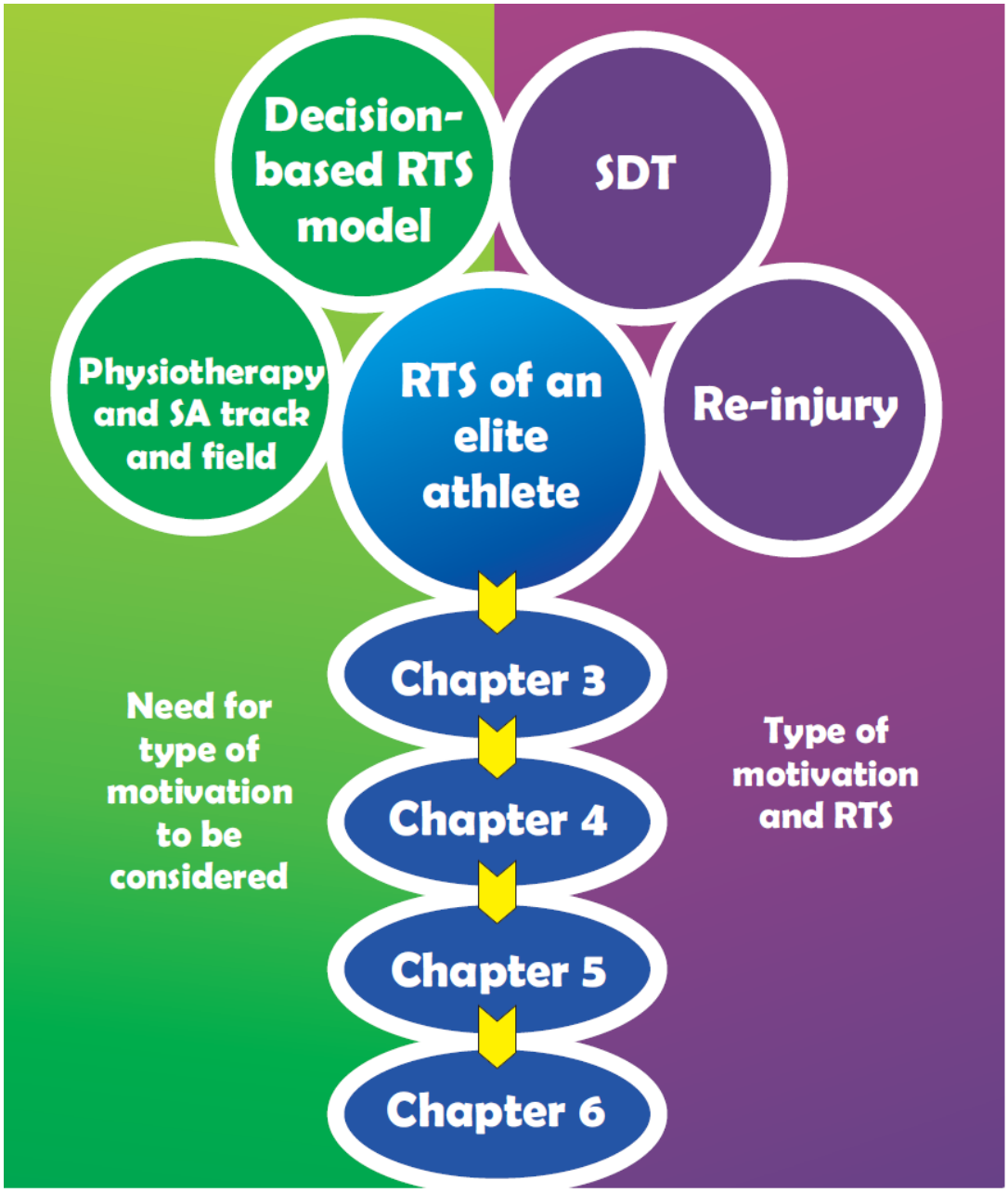


***Figure 1.3 The interrelated discussion of concepts within the study context.***

The second chapter provides a comprehensive discussion of the literature regarding the above-mentioned concepts. The training and competing environment of an elite athlete in Bloemfontein (and South Africa) is explained due to the role it may play in psychological aspects. Role players and their

relatedness to one another and the athlete are described, in order to establish the place of a physiotherapist in RTS decisions. The decision based RTS model is explained as a developing objective tool to assist physiotherapists with RTS decisions. The pressure on an athlete and extrinsic pressure to RTS are explored and existing tools to measure these factors are investigated. The tools used to determine athletes' type of motivation to RTS were identified from this section of the discussion.

The methodology of the research is presented in chapter 3, where the sampling methods, measuring instruments, data collection procedures and ethical principles are discussed. The methodology was designed to determine a need for the type of motivation to be considered in RTS decisions and to investigate the possible relation between the type of motivation for RTS of an elite athlete who was injured during the season, and the possible re-injury of that elite athlete after RTS. A structured interview was compiled in order to determine whether track and field coaches have a need for physiotherapists to determine the type of motivation of an athlete to RTS and secondly, a cohort-analytical study was used to collect data regarding the type of motivation of elite athletes who were about to RTS and subsequent re-injury during the remainder of the season after RTS.

The results of this study are presented in chapter 4. The results are explained by graphs and tables depicting relevant information to gain insight into the interpretation of the results. The statistical analysis used for each calculation is defined, and the results are presented in the context of normal values, where applicable and available.

Chapter 5 concludes the study with a discussion of the objectives and subsequent outcomes of the study. Results (described in chapter 4) are compared to literature (discussed in chapter 2). Questions are answered, phenomena are explained, new questions are raised and recommendations and limitations are identified. The dissertation concludes with chapter 6 where a summary of the most important aspects of the study and outcomes is provided.

# *Chapter 2*
# LITERATURE REVIEW

## 2.1 Introduction

Continually higher levels of performance are expected from elite athletes (Burgess 2011). Large financial rewards and increasing media attention amplify this public demand on athletes (Burgess 2011). Kreiner-Phillips and Orlick (1993) warn that success brings not only expectations and demands, but also changing roles - from a private individual to a public hero. Future success or failure can be the direct outflow of the way in which athletes deal with these demands.

The conflicting role of a public asset and the demands on a winning athlete can influence the athlete's future preparations for competitions (Philips and Orlick 1993). According to Botha (2016), the more successful an athlete becomes, the more extrinsic demands there will be on the athlete. Athletes have to be available for media launches, radio and television interviews, sponsor photoshoots, advertisement campaigns, public appearances and reward acceptances. Botha (2016) mentions that all of these interfere with the normal preparation of the athlete for the next season. Because of all the media attention, the demands on the athlete to perform even better, increase (Burgess 2011). The increased demand from the public and media, but with less available time for proper preparation for exceptional performances, places immense pressure on the athlete, the coach and the medical and fitness support structure of the athlete (Botha 2016). Botha (2016) also mentions that injuries are bound to occur. While an athlete is unknown to the public, the management of these injuries and RTS after an injury is a more controlled, gradual process. Burgess (2011) states that the public demand on an injured winning athlete to RTS is high.

Injured athletes have different motivations to RTS. These motivations include intrinsic as well as extrinsic motivations. Podlog and Eklund (2010) define

intrinsic motivation as the need for intrinsic pleasure and a sense of fulfilment. Pelletier, Rocchi, Vallerand, Deci and Ryan (2013) further elaborate that intrinsic motivation is when someone does something that is inherently interesting or enjoyable. In contrast, extrinsic motivation is described by Pelletier *et al.* (2013) as something that is done as a means to an end. Financial encouragement by sponsors and associations on national and international levels, as well as sanctions, may act as extrinsic encouragement for athletes to RTS (Bianco in Podlog and Eklund 2010).

## 2.2 Track and field in South Africa

Various track and field athletes performing at national and international competitions and therefore, subject to the above motivations, are coached and prepared for their competitions at the University of the Free State (UFS) in Bloemfontein (Kovsie athlete 2015). In order to understand how athletics in Bloemfontein fits into the framework of international/competitive athletics, and how the researcher assembled the samples from the populations for this study (refer to 3.2.2 and 3.2.3), the structures of athletics are explained in detail. The explanation further enlightens the reader on a typical training season relevant for elite athletes, specifically from South Africa, due to the differences in the track and field seasons in the Southern and Northern hemispheres.

### 2.2.1 Athletics in Bloemfontein and athletics in the world.

Athletics is a broad term referring to cross country, road running and track and field. Athletics South Africa (ASA) is the only member federation in South Africa affiliated with the International Association of Athletics Federations (IAAF). ASA controls all athletics in South Africa. Athletics Free State (AFS) is one of the 17 affiliated provincial members of ASA (ASA 2015a) (refer to Figure 2.1).

University Sport South Africa - Athletics (USSA-athletics) is not considered to be a provincial member of ASA, but is an associated member. The UFS

athletics club is affiliated to USSA athletics but it is also managed by the provincial office in the Free State. Bloemfontein is one of the magisterial districts managed by AFS - as illustrated in Figure 2.1.
Athletes and coaches are members of ASA via their respective provinces.

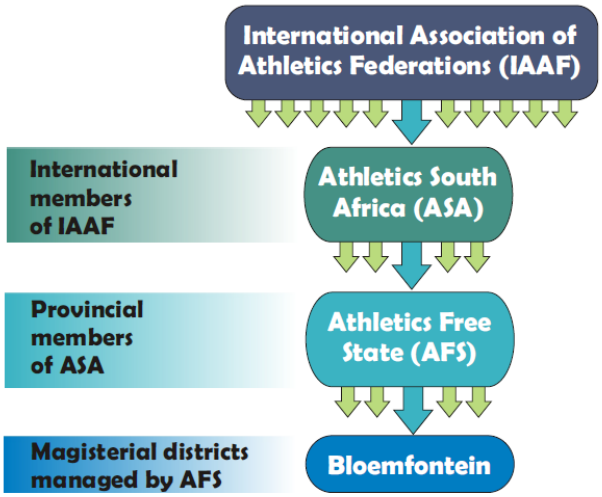


***Figure 2.1 Organogram of the relevant structures responsible for the management of athletes and coaches in Bloemfontein***

This means that all coaches and athletes from Bloemfontein are members of ASA via registration managed by AFS (ASA 2015a). Provincial championships are organised by provincial member offices and national championships are managed by ASA and organised by the relevant provincial member where the event takes place. Different national championships are held for the different age groups of athletes registered with ASA (ASA 2016).

### 2.2.2 Age groups for National and International Competitions

Coaches in South Africa coach athletes of different age groups. These age groups have the opportunity to participate at various national and international competitions that are stipulated on the annual fixtures published by ASA (ASA 2016). In order to clarify why athletes can participate at more than one national championship and various national and international events, the different age groups and competitions for track and field are discussed below. This is relevant to the study because elite junior and senior athletes are

included in the study (see the populations for the study in 3.2.2) and their participation at various national and international events were investigated.

The different age groups classified by the IAAF are:

- Under 18 (Youth) – any athletes aged 16 and 17 years on 31 December in the year of the competition,
- Under 20 (Junior) – athletes aged 18 and 19 years on 31 December in the year of the competition, and
- Master – any athlete who has reached his/her 35$^{th}$ birthday (IAAF 2015).

ASA also recognises the following additional age groups for national competitions, but the aim with these age groups is national development and not international participation:

- Under 16 (Sub-Youth) – any athlete aged 15 and younger on 31 December in the year of the competition, and
- Under 23 – any athlete aged 20, 21 and 22 years on 31 December in the year of the competition (ASA 2016).

The competition season for most elite South African athletes is from March to May of each year and can progress into an international season which can continue until September. An athlete aged 19 registered at the UFS in Bloemfontein can compete at national championships organised for the junior age group, the senior age group and also students, while a 20-year-old athlete from the UFS can compete at the national championships organised for the under 23 group, the senior age group and also students (IAAF 2015 and ASA 2016). These national championships are held annually from March to May. Additional meets are organised for local athletes to allow them to compete and qualify for national teams. National and aspiring national athletes also participate abroad at international meets organised under the rules and regulations of IAAF, until September (ASA 2016).

### 2.2.3 Selection for Provincial and National Teams

Athletes in this study are referred to as provincial and/or national athletes. Selection of athletes to represent their province and/or country is subject to selection criteria explained below.

The age groups that are eligible for team selection by ASA are senior, junior and youth teams. ASA selects preparation squads in August/September. From these squads ASA selects a preliminary team in April/May of the following year and then a final ASA team is selected three to eight weeks prior to the relevant international events (ASA 2015b).

Athletes are considered for inclusion in the preparation squads if they are older than 15 years, achieved the IAAF qualifying standard for a specific event in the preceding year, have the potential to achieve the IAAF qualifying standard in future or if an athlete won a medal at the preceding IAAF Championships (ASA 2015b). This means that athletes in the preparation squads who are injured after inclusion in the squad, can RTS and ensure that they are ready for inclusion in the preliminary team and then finally the ASA team. Inclusion in the team to the Olympic Games held in Rio de Janeiro in 2016 was the aim for many athletes and coaches during the past season and several athletes in Bloemfontein attempted to qualify for inclusion in this team, in both local and international competitions and events.

## 2.3 The role and background of track and field coaches

Not all athletics coaches were considered for inclusion in this study (refer to 3.2.2.1). Coaches in track and field are graded according to the Five-level IAAF Coaches Education and Certification System (CECS). This system progresses a coach through experience and education, from a level 1 youth coach to a level 5 academy coach. Level 1 coaches are usually based at schools and the objective for these coaches is to develop skills to organise Kids Athletics for 13 to 15-year-old athletes. The highest level that can be achieved by a coach is level 5 and the aim for these coaches is to develop a

professional specialisation in coaching. These coaches are highly experienced and active coaches are usually based at universities and clubs (IAAF 2007).

### 2.3.1 Interaction between coaches and physiotherapists

Tracey (2008) found that injured athletes consider their physiotherapists and athletics coaches to be authoritative participants in their emotional and psychological healing. The relationship according to Brukner and Kahn (2008) is shown in Figure 2.2.

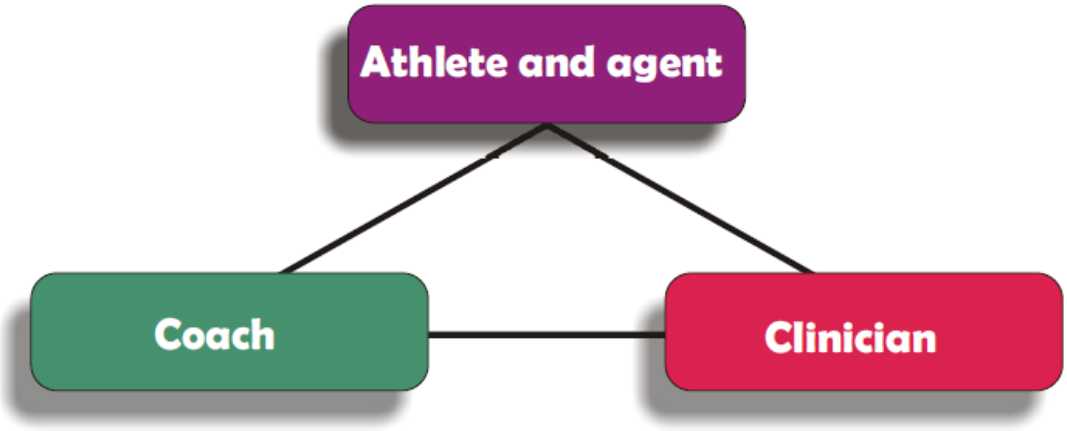


***Figure 2.2 The coach, the athlete and the clinician (Brukner and Kahn 2008)***

Brukner and Kahn (2008) explain the advantages of a trusting relationship between the physiotherapist and an athlete. This includes a feeling of mutual trust and confidence, implying that the athlete will confide in the physiotherapist and the physiotherapist will trust the athlete to comply with his/her advice. The coach is, however, responsible for the training and performance of the athlete. Brukner and Kahn (2008) advise involving the coach in all medical decisions concerning the athlete.

Physiotherapists in Bloemfontein most frequently have to make RTS-decisions for rugby and athletics (Erasmus, Hay, Steyn, Theron, Rothmann, Wilson and Brandt 2014). The physiotherapists in their study were, however,

of the opinion that physiotherapists, biokineticists and sport doctors were the main professionals involved in RTS decisions.

It is highlighted by Brukner and Kahn (2008) that the relationship between coaches and clinicians (including physiotherapists) is not always one of trust. They mention that coaches often feel that the main role of a clinician is to prevent the athlete from training and competing.

#### 2.3.1.1 Trust between coaches and physiotherapists

It is important for the clinician (physiotherapist) to explain to the coach that he/she is also aiming to maximise the performance and health of the athlete. The agent of a professional athlete will also be involved when major injuries occur. A good practitioner-coach relationship will assist in coaches seeking assistance from the physiotherapist when minor injuries occur and this will often help to prevent major injuries (Brukner and Kahn 2008). Brukner and Kahn (2008) further explain that in a trusting relationship, discussions with the coach may assist in the identification of the cause of the injury.

#### 2.3.1.2 Coaches' expectations of physiotherapists as regards RTS

According to Podlog and Eklund (2007), professional coaches expect physiotherapists and medical practitioners to give the go-ahead for RTS after an injury. Harrast, Laker and Maslowski in Braddom (2011) also consider clearance of an athlete to RTS after injury as one of the responsibilities of a physiotherapist or clinician. In the research study by Erasmus *et al*. (2014), the authors concluded that physiotherapists in Bloemfontein have an important role in RTS decisions of injured athletes. The majority of the respondents in this study indicated that physiotherapists are involved in inter-disciplinary teams in Bloemfontein that decide when an athlete is ready for RTS. Most of the respondents were also of the opinion that physiotherapists have authority to make non-urgent RTS decisions as well as urgent (same day on the field) decisions (Erasmus *et al.* 2014). Shrier, Safai and Charland

(2014) found that coaches and athletes consider physiotherapists most capable to assess risks for re-injury.

#### 2.3.1.3 Guidance from the physiotherapists regarding training

Podlog and Eklund (2007) also explain that the coaches expect guidance from the practitioner or physiotherapist on the amount and extent of training allowed for the specific athlete, following an injury. Most physiotherapists in Bloemfontein prefer to treat patients with injuries during regular follow-up visits and prescribe progressive activity participation until the athlete is ready for RTS (Erasmus *et al.* 2014). According to Le Roux in Sutcliff (2005), a physiotherapist has become one of the greatest assets to any coach. He explains that physiotherapists assist with the reinstatement of injured athletes in order to ensure the greatest prospects for success. Brukner and Kahn (2008) also remind the physiotherapist that a coach involved in the decision-making process will increase the compliance of the athlete. Potential conflict may, however, arise when the coach wants an athlete to resume duty too soon after sustaining an injury (Millson 2015).

This conflict may be even more complicated when some information cannot be disclosed to the coach. Harrast, Laker and Maslowski in Braddon (2011) caution physiotherapists to remember that some information gained from the physiotherapist-patient relationship is confidential and cannot be discussed with the coach. They explain that it is important to realise that the primary obligation is to consider the athlete as a patient first, in order to prevent re-injury or further injury. This means that one should discuss these matters with the athlete and the coach before these situations occur (Harrast, Laker and Maslowski in Braddon 2011).

## 2.4 Re-injury of athletes

Timpka, Jacobsson, Bickenbach, Finch, Ekberg and Nordenfelt (2014) define 'sports injury' to denote *the loss of bodily function or structure that is the object of observations in clinical examinations*.

Tissue that has not healed is usually weaker than before and is more likely to be re-injured (Creighton *et al.* 2010). Brukner and Kahn (2008) explain that treatment of an injury ideally comprises treating the presenting injury, but also addressing the cause of the injury. This could mean that an athlete's injury may be healed but the athlete may be at high risk for re-injury if the cause of the injury has not been corrected. It is thus important to treat the patient as an individual: an Olympic athlete who needs to perform at certain levels of criteria (explained in 2.2.3) may require different treatment to someone who participates in a weekly park run (Brukner and Kahn 2008).

Brukner and Kahn (2008) explains that incorrect biomechanics need to be considered as a cause of an athlete being more prone to injury. Incorrect biomechanics include the wrong technique, muscle weakness, decreased range of motion of joints, structural abnormalities and decreased stability. Hoogenboom (2015) adds hypermobility as a possible contribution to overuse injuries but concludes that more research is needed to confirm hypermobility as a factor. Hoogenboom (2015), however, highlights concussion as a special type of injury because nearly all athletic endeavours pose a risk for concussion. Although this injury is considered to be micro trauma, the author challenges this assumption. Repeated micro trauma is a significant health concern, according to Hoogenboom (2015), and she explains that the recurrence of injuries and repeated overuse injuries can lead to high costs, lost participation time and high rehabilitation costs.

Other factors that should be investigated in order to assist in the prevention of re-injury are proper and correct warm-up, appropriate stretching, taping and bracing, protective equipment, suitable equipment, appropriate surfaces, appropriate training, adequate recovery, psychology (which relates to the motivational aspects in this study) and nutrition (Brukner and Kahn 2008). The correct use of apparatus or equipment in sport also needs to be investigated (Brukner and Kahn 2008). Creighton *et al*. (2010) explain that an athlete's dominance may also cause an injury to re-occur e.g. a high

jumper who takes off from the same leg during jumps or a hurdler who has different actions for the leading leg and the trailing leg.

Hoogenboom (2015) suggests that specialisation at a young age must be considered a contributory factor to possible re-injury, especially due to the higher incidence of overuse injuries in athletes who specialise before the age of 10 years. Hoogenboom (2015) also mentions that adolescents and children are more vulnerable to injuries to their skeletal structures, which may have long-term sequelae, such as re-injury. Marchi, Di Bello, Messi and Gassola (1999) found that permanent sequelae after sports injuries in specifically children and adolescents is high. Sixty percent of their subjects still had sequelae 12 years after a sport injury incident. The type of activity was not significant to the likelihood of sequelae, but the severity, the type and location of the lesion were. Tursz and Crost (2000) found that the percentage of sequelae increased regularly with the age of the children, due to the increase and severity of sport injuries as children grow older.

As explained in 2.3.1, a good relationship with the coach can be an advantage to a physiotherapist in identifying possible causes for the injury and to adjust these causes in order to prevent re-injury.

## 2.5 Complexities of beneficence

Possible conflicts may arise when the player wants to RTS too soon, the medical team does not want the player to RTS or when the player does not want to RTS and exacerbate a pre-existing injury (Millson 2015). This is where the principle of beneficence might be in conflict with the self-determination or autonomy of an athlete (Burgess 2011). Beneficence as one of the core ethical principles should be pursued, but the application of beneficence might be complex (Millson 2015). Early RTS might position the athlete at high risk of re-injury, but also for the development of permanent psychological trauma (Slobounov 2008).

Brukner and Khan (2008) further warn that the involved clinical person might be under pressure from various sources to allow the athlete earlier RTS. Millson (2015) advises clinical personnel to be aware of what their contracts with their employers stipulate in these cases. Due to the nature of one's involvement with athletes during competitions, Millson (2015) also warns that one has to remain aware of subjectivity. Subjective decisions on RTS can be caused by emotional involvement in the success of the athlete (Johnson in Burgess 2011). If the clinical person cannot make an objective decision, Burgess (2011) advises that an external, unbiased professional must be consulted. Millson (2010) identified a lack of standardised RTS procedures and protocols as problematic to these situations. Myer *et al.* (2006) also point to a lack of standardised objective criteria to assist with assessment of an athlete's ability to safe RTS.

Millson (2015) proposed that standardised RTS procedures and protocols should be developed and implemented in order to support more objective clinical decisions by the clinical team. It is, however, the responsibility of the lead physician to make RTS decisions. As explained in 2.3.1, this responsibility is often that of the physiotherapist of the athlete. Athletes may and should be referred to other specialists for further consultation on final clearance to RTS; however, this may complicate a situation when there is already conflict between the coach and the leading physician/physiotherapist (Harrast, Laker and Maslowski in Braddon 2011).

## 2.6 The Decision Based RTS Model

Creighton *et al.* (2010) developed and proposed the Decision Based RTS Model (refer to Figure 1.2) to assist with clinical decisions.

The model consists of three steps as illustrated in Figure 2.3 and each step is determined by various factors and modifiers as illustrated in Figures 2.4, 2.5 and 2.6. Creighton *et al.* (2010) suggests that each one of these factors and modifiers should be topics for further research.


***Figure 2.3 Decision Based RTS Model - three steps (Creighton et al. 2010)***

### 2.6.1 Step 1: Evaluation of Health Status

*Evaluation of Health Status* is done to evaluate the amount of healing that has occurred in order to determine how close to "normal" the athlete is. Tissue that has not healed is usually weaker than before and is more likely to be re-injured (Creighton *et al* 2010). The *Evaluation of Health Status* of the athlete is the first step illustrated in Figure 2.3 of the Decision Based RTS Model. This requires the medical person to consider several medical factors

illustrated in Figure 2.4, in order to assess an athlete's recovery from biological, psychological and functional components of the injury.


***Figure 2.4 Step 1 of the Decision Based RTS Model (Creighton et al. 2010)***

The first medical factor illustrated in Figure 2.4 that needs to be considered is *Patient demographics*. The gender and age of an athlete are factors that can affect tissue healing (Millson 2015b). According to Hoogenboom (2015), skeletal maturity is typically completed by the age of 18 in females and 21 to 22 years in males. Open epiphyses in these populations make them more vulnerable to injury. Other examples of injuries related to age and gender are Achilles tendinopathy, patellofemoral dysfunction or pain and patellar tendinopathy (Cassel *et al.* in Hoogenboom 2015). *Symptoms* (pain, oedema, sensation of instability and stiffness) are factors which may indicate that healing is not complete (Brukner and Kahn 2008).

Brukner and Kahn (2008) also highlight the importance of considering the athlete's family history and *personal medical history* which can be relevant to the recurrence of injuries. *Signs* such as muscle strength and joint range of motion (ROM) should be clinically evaluated. Creighton *et al*. (2010) suggest that due to discrepancies in the literature, these signs should be dealt with clinically by the medical practitioner until consensus is reached in the literature. Laboratory tests such as X-rays, magnetic resonance imaging (MRI), computed tomography (CT-scans), bone scans and ultrasound imaging can assist healthcare professionals with objective evidence of structural and physiological abnormalities (Creighton *et al*. 2010). Hoogenboom (2015) mentions that several *functional tests* exist which can predict an athlete's probability of re-injury. These tests assess an athlete's

balance, proprioception, functional ROM and movement. Creighten *et al*. (2010) also advises that stresses and forces which will be experienced during competition should be introduced during functional testing.

Glaser (2009) explains that there is a higher risk for re-injury if the athlete experiences apprehension, fear and anxiety. He also warns that these factors regarding *psychological state* can have a negative effect on an athlete's performance.

According to Creighton *et al*. (2010) the health status of an athlete can be *potentially more serious* for a concussion versus an ankle sprain, taking into account the specific sport that will be competed in.

Some of these medical factors e.g. patient demographics, symptoms, personal medical history, signs, laboratory tests and potential seriousness, can be evaluated by existing objective scales and objective measures. These include functional tests with measurable results (Gabriel 2011), scales such as the Activities of Daily Living Scale, the American Academy of Orthopaedic Surgeons Sports Knee Rating Scale, Knee Injury and Osteoarthritis Outcome Score (KOOS), Lysholm Knee Scale, Cincinnati Knee-Rating Scale, proprioception tests, ROM measurements, neural tests, neuromotor control tests, muscle length tests, Functional Movement Screen, and Y-Balance test (Allen, Martin and Place 2011; Millson 2015; Hoogenboom 2015). Millson (2010), however, concluded that there is still a lack of consensus regarding RTS scales and scores.

### 2.6.2 Step 2: Evaluation of participation risk

The second step of the model is represented in Figure 2.5 and entails the evaluation of participation risk (Creighton *et al.* 2010).


***Figure 2.5 Step 2 of the Decision Based RTS Model (Creighton et al. 2010)***

Brukner and Kahn (2008) associate some injuries with certain *types of sport*. Patellar tendinopathy can be associated with high-jump athletes and tibia stress fractures, with long-distance runners. Creighton *et al.* (2010) explain that collision sports such as rugby usually pose a higher risk for injury, compared to contact sport such as basketball. Non-contact sports like swimming poses an even lower risk for injury but high-velocity sports like alpine skiing pose a high risk for serious injury. Different *positions* within a specific sport may require different skills from players in the team. This may expose the players of a specific sport to different injuries (Creighton *et al.* 2010). As explained in 2.4, an athlete's *dominance* may also cause an injury to re-occur. Athletes with a higher *competitive level* are more likely to have a higher risk for injury (Creighton *et al*. 2010). Hoogenboom (2015) consequently advises that specific intense training should be avoided before the age of 10. Taping, bracing, splinting or padding may improve the *ability to protect* and reduce the risk of re-injury. Various techniques of strapping are used to assist athletes to manage RTS (Brukner and Kahn 2008). It is, however, interesting that Hoogenboom (2015) mentioned that an increase in the amount of protective equipment used appears to increase the rate of injury in males and decrease the rate of injury in females.

### 2.6.3 Step 3: Decision Modification

The third step or Decision Modifiers (Figure 2.6) may change the decision that would have been made if the risks were the only considerations. There are three important considerations with Decision Modifiers. Firstly, these modifiers can harm the athlete's family, coach or even doctor if the athlete is allowed or prevented from RTS. Secondly Creighton *et al.* (2010) acknowledge that not all the modifiers may be seen as appropriate by some clinicians and lastly, Decision Modification is set aside from the other two steps of the model. Creighton *et al.* (2010) explain that Participation Risk does not provide information about Decision Modification and Participation Risk must be known before Decision Modification can be used.


***Figure 2.6 Step 3 of the Decision Based RTS Model (Creighton et al. 2010)***

The decision modifiers illustrated in Figure 2.6 are:

i. ***Timing and season***: During the preparation phase of the season, there may be less benefit for the athlete to RTS compared to during the competition phase of the season. As explained in 2.2.3, athletes' need to qualify for ASA national teams and selection depends on performances at certain times of the season. Erasmus *et al.* (2014) concluded that *timing and season* is the most important decision modifier during RTS-decisions.

ii. ***Pressure from athlete***: As explained in 2.5, the autonomy of an athlete to make his/her own decisions regarding RTS may be in conflict with the beneficence of a physiotherapist who recommends that an

athlete does not RTS yet. Harrast, Laker and Maslowski in Braddom (2011) also mention that athletes can legally challenge non-clearance decisions and may participate, despite medical judgment. Millson (2015) advises clinicians to obtain informed consent from an athlete who decides not to adhere to the clinician's recommendation regarding RTS.

iii. ***External pressure***: Coaches, teammates, relatives, team administrators, agents, sponsors, league officials, fans, and media may all benefit from an athlete's RTS. According to Millson (2015b) these groups may have the potential to influence the RTS decision. Consequently, the relationship between the coach and the physiotherapist, explained in 2.3.1, is of exceptional importance.

iv. ***Masking the injury***: Creighton *et al*. (2010) consider cortisone injections, local anaesthetics and analgesics to mask injuries as very common in sport medicine.

v. ***Conflict of interest***: Millson (2015b) advises clinicians to familiarise themselves with their contractual obligations towards the management and other role players in the team, e.g. a coach may lose his/her job if the team does not perform and conflicts may arise between the clinician and the coach regarding a specific player's RTS. As mentioned in 2.6.3(iii) above, the relationship between the coach and the physiotherapist is also of importance with possible conflict of interest.

vi. ***Fear of litigation***: Millson (2015b) mentions that clinicians may be sued when an athlete is injured after RTS. Harrast, Laker and Maslowski in Braddom (2011) support this statement and state that a physician might be held liable if an athlete is cleared for RTS despite the presence of a medically contra-indicated condition. Millson (2015b) reminds clinicians of the importance of proper clinical notes and informing athletes of all the risks involved in RTS.

Psychological factors and modifiers should also be evaluated by objective measures. The psychological state, the level of competition, pressure from

the athlete, external pressure, conflict of interest and the fear of litigation are modifiers included in the Decision Based RTS model that can have an influence on an athlete's psychological readiness for RTS (Creighton *et al.* 2010). Podlog and Eklund (2007) mention that coaches are aware of psychological modifiers that can influence RTS and that coaches individualise their approach in assisting each athlete with psychological factors for RTS. It was, however, mentioned that participants of the study might have presented themselves in a socially acceptable light and that discrepancies regarding assistance that coaches suggested they offer returning players, and the "actual" assistance offered may exist (Podlog and Eklund 2007). This possible discrepancy motivates the need for transparent objective measures for psychological factors and modifiers. Matheson *et al.* (2011) also highlighted the lack of research on the factors and components of the model.

As explained in 2.3.1.2, physiotherapists are trusted to provide objective opinions and instructions regarding RTS (Podlog and Eklund 2007). "Pressure from the athlete" and "external pressure" are two components of the proposed model that can modify a physiotherapist's decision on RTS (Creighton *et al*. 2010).

Glaser (2009) developed the Injury-Psychological Readiness to Return to Sport (I-PRRS) Scale. This scale focuses on the confidence of an athlete and does not address all the mentioned psychological factors and modifiers in the Decision Based RTS Model (Creighton *et al.* 2010). Most of the earlier scales to measure motivation did not include a measure of integrated regulation as described by the SDT (Pelletier, Tuson, Fortier, Vallerand, Briere and Blais 1995).

## 2.7 Self-determination theory

The SDT is a theory of motivation, personality and optimal functioning. This theory is based on the assumption that humans strive for three innate psychological needs that are considered to be universal necessities. These are namely: greater competence, relatedness and autonomy (Tran 2014). Competence is when individuals have a desire to seek challenges, express their capacities and develop their confidence in order to master their environment. Relatedness is a sense of belonging with others. Autonomy is when an individual can act in ways that are in harmony with his or her own interests and values (Pelletier *et al.* 2013).

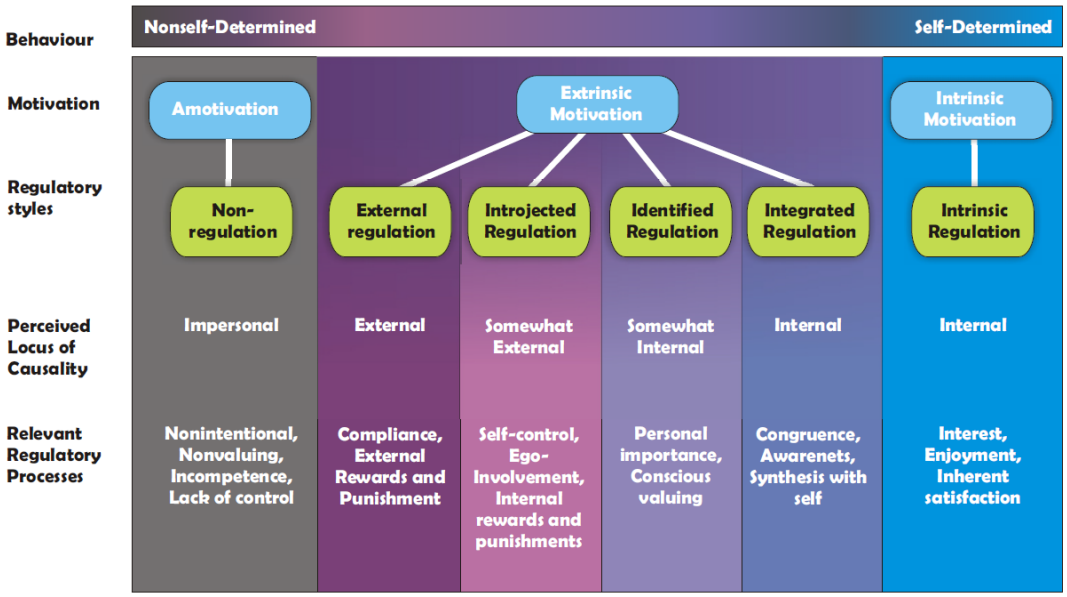


***Figure 2.7 The Self-Determination Continuum illustrating Types of Motivation with their Regulatory Styles, Loci of Causality, and Corresponding Processes (Ryan and Deci 2000)***

Ryan and Deci (2000) explain how the SDT consists of a continuum with *amotivation* on the far left, meaning no intention to act, and *Intrinsic Motivation* on the far right, namely performing an activity for the inherent satisfaction of performing the activity (Figure 2.7). Ryan and Deci (2000) identify and describe four classifications of extrinsic motivations between Amotivation and Intrinsic Motivation, varying in their degree of autonomy. *Externally motivated* is behaviour that is least autonomous and is the type of behaviour expressed

in order to satisfy an external demand or reward. *Introjected regulation* is behaviour that is expressed in order to avoid guilt or anxiety. An example of introjected regulation would be someone who demonstrates abilities or avoids failure in order to maintain a feeling of worth. *Identified regulation* is more autonomous and is an action which is considered as personally important. *Integrated regulation* is the most autonomous form of extrinsic motivation. Although similar in many ways, integrated regulation activities can be distinguished from intrinsic motivation activities because they are performed to achieve distinguishable outcomes rather than for their natural pleasure.
Mallett, Kawabata, Newcombe, Otero-Forero and Jackson (2007) criticise the Sport Motivation Scale (SMS) for not including a measure for integrated regulation as described in the SDT.

### 2.7.1 The Sport Motivation Scale

The *Echelle de Motivation dans les Sports* (Brière, Vallerand, Blais and Pelletier 1995) and the *Sport Motivation Scale* (Pelletier, Tuson, Fortier, Vallerand, Briere and Blais 1995) are French and English versions of the Sport Motivation Scale (SMS). The SMS consists of 28 items and these items represent seven factors, with four items related to each factor. The seven factors are three types of intrinsic motivation, three of the four types of extrinsic motivation explained in the SDT and amotivation. Due to the effective and substantial use of the SMS there is now a better understanding of sport motivation (Pelletier *et al.* 2013). It was, however, necessary to adjust and revise the SMS in order to represent all the constructs in the SDT (Mallett *et al*. 2007 and Pelletier *et al.* 2013).

### 2.7.2 The Revised Sport Motivation Scale

In 2010 a panel of experts on sport motivation and the SDT revised the structure of the SMS (Pelletier *et al*. 2013). Existing items were critically discussed and new items were considered for inclusion in order to construct a revised scale which had less items and better represented the constructs in the SDT. The number of items per factor was reduced to three in order to

reduce the overall length of the scale. The seven original factors mentioned in 2.7.1 were also decreased to six by replacing the original three types of intrinsic motivation with a single factor. A fourth factor, integrated regulation, was added to the three existing extrinsic motivation factors. These changes meant that 12 items related to intrinsic motivation (three factors with four items each) were changed to three items for intrinsic motivation (one factor with three items). The total number of items was decreased to 18 from the original 28. The revised sport motivation scale (SMS-II) reflects an athlete's motivation, from the least self-determined to the most self-determined, namely amotivation, external regulation, introjected regulation, identified regulation, integrated regulations and intrinsic motivation (Pelletier *et al*. 2013). According to Pelletier *et al.* (2013) the SMS-II is expected to demonstrate strong construct validity and reliability and the SMS-II will also demonstrate better support for the SDT. Lonsdale, Hodge, Hargreaves and Ng (2014), however, question the superiority of the SMS-II compared to the Behavioral Regulation in Sport Questionnaire (BRSQ) and are of the opinion that further work needs to be done on both the SMS-II and the BRSQ.

## 2.8 Conclusion

Based on theory and research, the suggested research on the components of the proposed RTS decision based model explained in 2.6 served as motivation to determine whether athletic coaches have a need for the type of motivation of an athlete to be considered when decisions about RTS of an athlete are made. This need was investigated and research was conducted on the type of motivation and subsequent re-injury of athletes who are returning to sport (Matheson *et al.* 2012).

# *Chapter 3*
# METHODOLOGY

## 3.1 Introduction

This chapter provides a description of the methodology, the research process as well as the steps taken in order to guarantee the validity of the study.

## 3.2 Research methodology

### 3.2.1 Study design

Babbie (2007) advises that the best study design includes more than one research method in order to obtain maximum benefit from the strengths of different methods of research. Creswell and Clark (2011) support this advice and state that a need often exists to enhance a study with a second method.

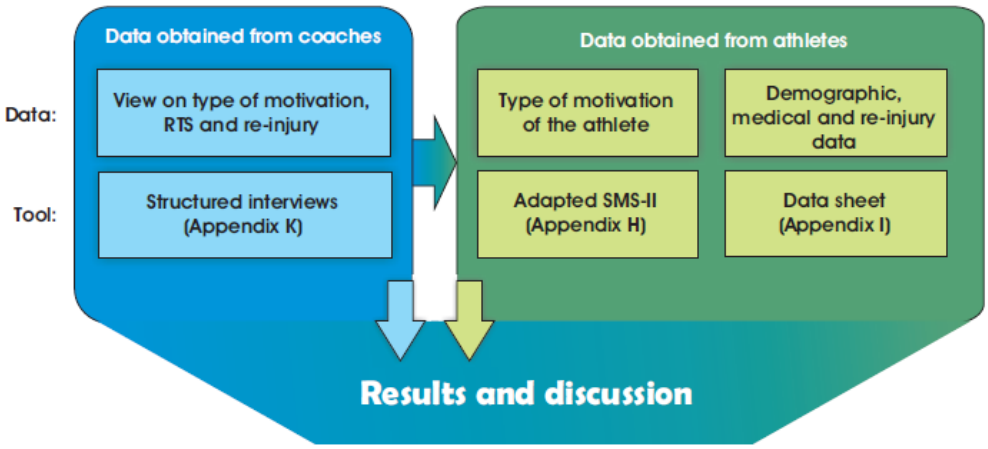


***Figure 3.1 Flow diagram of study design.***

In this study a descriptive and cohort-analytical design was used. A cohort analysis entails the study of a specific sub-population over time (Babbie

2007). The flow diagram illustrated in Figure 3.1 illustrates how data from athletes was collected by means of an adapted revised version of the SMS-II (Appendix H). Data obtained from athletes was entered onto a data sheet (Appendix I). The analytical research was supported by means of a descriptive component. The descriptive component consisted of interviews with coaches, including structured questions (Appendix K).

### 3.2.2 Study population

As mentioned in 3.2.1 both coaches and athletes in track and field were involved in this study. Selection of elite athletes and their coaches in track and field for the populations provided for improved control over decision modifiers (refer to 2.6.3) that were not investigated by the researcher in this study. Modifiers like "*timing and season*", "*conflict of interest*" and "*fear of litigation*" were better controlled because the athletes had similar preparation and competition seasons (refer to 2.2) and athletes were exposed to similar pressure from clubs and authorities because they were all registered at AFS and was located in Bloemfontein (refer to 2.2). The athletes were also treated by a smaller population of physiotherapists located in Bloemfontein and the physiotherapists from Bloemfontein was included in a pregraduate study to investigate their physiotherapeutic decisions with regards to RTS (Erasmus *et al*. 2014).

#### 3.2.2.1 Track and field coaches

The data obtained to establish the need for the type of motivation of an athlete to be considered in decisions regarding RTS, was collected from track and field coaches in Bloemfontein. Coaches had to be registered with Athletics Free State (AFS) and had to coach athletes in Bloemfontein older than 18 years, and who had represented their province and/or country during the previous track and field season (refer to 2.2.1 and 2.3).

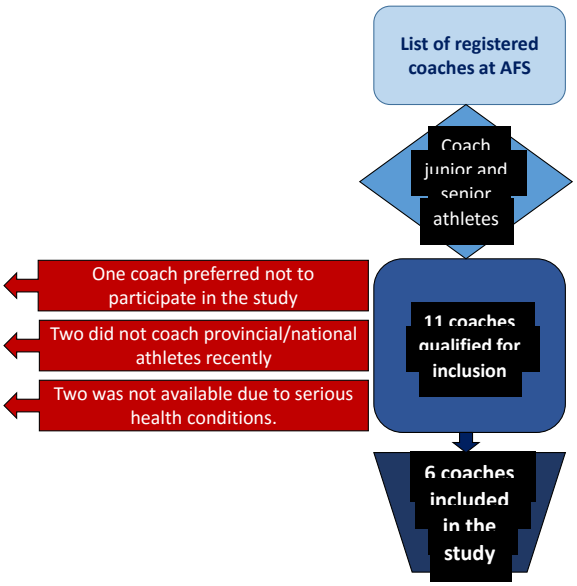


***Figure 3.2 Flow diagram to illustrate how the six coaches for this study were selected for inclusion***

A contact list of registered coaches in Bloemfontein, who coach track and field athletes older than 18 years was obtained from the office of AFS (Swarts 2016). In Figure 3.2 it can be seen that eleven coaches qualified for inclusion in the study. The inclusion and exclusion criteria explained in 3.2.4 were used in order to determine which coaches were included in the study. One of these coaches was excluded due to his/her unwillingness to participate in the study and another two were hospitalised during the execution of the study due to serious health issues and were not available for inclusion. During the interviews it was also established that two of these remaining coaches had not recently (during the past ten years) coached athletes older than 18 years and they were excluded from the study (refer to 3.2.4). The remaining six coaches were included in this study.

#### 3.2.2.2 Athletes

The population of athletes used to determine the type of motivation and the possible subsequent recurrence of injury, consisted of 15 athletes who had sustained injuries during the current season and were about to RTS

after treatment by a registered physiotherapist. The number of injured athletes is considered to be high, as the team of athletes from the region who competed at national championships never exceeded 50 during the season. This means that 15 of these 50 athletes were injured during the season and returned to sport during the season. This population comprised injured elite athletes older than 18 years, who are registered at AFS and recently (during the seasons of 2015 and or 2016) represented the region and/or province at different competitions/championships. The athletes had to be treated by a physiotherapist in Bloemfontein before RTS.

### 3.2.3 Sample

In this study the researcher had to deal with a small population size. As explained in 3.2.2.1 and 3.2.2.2, the populations considered for inclusion in the study were small and the phenomenon of injured athletes occurred on a limited scale. It is advised by De Vos *et al.* 2005 that in such a case, it is preferable to involve the whole population in the study. Bless and Higson-Smith (2000) advises a sample that will represent all the properties of the population. Sampling of the different populations was handled as follows:

3.2.3.1 The whole population of available athletics coaches (total population sampling) was included in the sample if they met the inclusion criteria (refer to 3.2.2.1). Names and contact details were obtained directly from the offices of AFS (Swarts 2016).

3.2.3.2 The whole population of injured elite athletes in Bloemfontein (total population sampling) was included in the sample of athletes, if they met the inclusion criteria.

The following eligibility criteria were used to determine whether a coach or an athlete was to be included in the study.

### 3.2.4 Inclusion and exclusion criteria

#### 3.2.4.1 Coaches

(a) Inclusion criteria for coaches:

- Coaches had to be registered with AFS as track and field.coaches.
- Coaches had to have coached athletes representing the province/country during the 2015/ 2016 seasons.
- Coaches of all ages were considered for inclusion.
- Male and female coaches were considered for inclusion.
- Coaches of all races were considered for inclusion.
- Coaches had to be confident in understanding and expressing themselves in English or Afrikaans.

(b) Exclusion criteria for coaches:

- Coaches who did not coach athletes older than 18 years in the 2015 / 2016 seasons.
- Coaches who were not confident in either English or Afrikaans as a language of communication.

#### 3.2.4.2 Athletes

(a) Inclusion criteria for athletes:

- Athletes had to be registered as an athlete with AFS during the season when the injury occurred.
- Athletes had to represent a region or a province in South Africa (or must have represented South Africa) in track and field during the 2015 and/or 2016 seasons.
- Athletes had to be diagnosed by a registered physiotherapist and/or physician, with an injury that prevented the athlete from participation in at least one athletics meet on the AFS calender.
- The athlete had to be treated and cleared for RTS by a physiotherapist in Bloemfontein.

- Male and female athletes of all races and older than 18 years, were included in the study.

(b) Exclusion criteria:

- The questionnaire was available in Afrikaans and English and athletes who were not comfortable with at least one of these languages would not have been included in the study. However, no athletes were excluded from this study due to this criteria.

### 3.2.5 Data collection tools

Collection of the data was conducted in two different phases (refer to Figure 3.1).

#### 3.2.5.1 Measuring instrument for data collected from coaches

The questionnaire for the structured interview with the coaches (Appendix K) was compiled using data obtained by means of a thorough literature study, information obtained from keynote speakers' presentations at the Sport Physiotherapy Congresses (Millson 2010a, Millson 2015a, Millson 2015b and Hoogenboom 2015) and a personal interview with a subject expert (Millson 2010b). The structured interviews were used to collect data regarding the need for the type of motivation to be considered during decisions on RTS. The questions were grouped as follows:

i. general coaching experience and involvement
ii. coaches' expectations of physiotherapists
iii. referrals, and
iv. identifying the need for motivation to be considered before an athlete is cleared for RTS.

Closed-ended questions ensure uniform responses and are popular for synoptic studies. These are also easier to code than open-ended questions because responses can be directly coded (Babbie 2005). Both types of

questions were used in the interview (Appendix K). The questions (Appendix K) were translated to Afrikaans to allow for individual preference.

#### 3.2.5.2 Measuring instrument for data collected from athletes

An adapted version of the SMS-II (Appendix H) was used to collect data regarding the type of motivation of injured athletes. The initial SMS was used by Podlog and Eklund (2005) to determine athletes' motivations for RTS. With coefficients ranging from .58 to .84, the scale has demonstrated sufficient test-retest reliability and internal consistency (coefficients ranging from .63 to .85), as well as construct validity (Ryan and Deci 2000).

Podlog and Eklund (2005) made three modifications to the original SMS. The original SMS measured the motivation of an athlete to participate in their sport. Firstly, Podlog and Eklund (2005) adjusted the questionnaire stem from, "Why do you practise your sport?" to "I returned to sport following injury," in order to measure the motivation for an athlete to RTS following an injury. The respondents' responses were measured with a 7-point Likert scale with anchors of 1 (*does not correspond at all*), 4 (*corresponds moderately*), and 7 (*corresponds exactly*).

Secondly, two subscales were removed to reduce subject burden. Amotivation (complete unmotivated action) was excluded because the purpose of the questionnaire was to ascertain why athletes RTS after a serious injury. Two of the three types of intrinsic motivation were deemed most relevant and the adapted version retained five of the original seven subscales (Podlog and Eklund 2005).

Thirdly, two items of the SMS scale were modified to make them more appropriate for the purposes of the current investigation. The original item, "Because in my opinion, it is one of the best ways to meet people" was changed to, "Because I missed bonding with fellow teammates and/or other athletes competing in my sport." In addition, the original SMS item, "Because it is one of the best ways to maintain good relationships with my friends" was

reworded to, “Because I wanted to maintain good relationships with my friends, team mates and/or the coach.”

#### 3.2.5.2.1 The revised SMS-II

The revised SMS-II was compiled by Pelletier *et al.* (2013) and the original 28 item scale was reduced to 18 items to better represent the criteria set by the SDT described in 2.7. The following changes were made to the SMS-II in order to obtain similar results from the revised scale compared to the results obtained from the adapted SMS, adjusted by Podlog and Eklund (2005):

- “Why do you practise your sport?” was also changed to, “I returned to sport following injury” for the same reason explained in 3.2.5.2 above. A 7-point Likert scale with anchors of 1 (*does not correspond at all*), 4 (*corresponds moderately*), and 7 (*corresponds exactly*) was used for the athlete’s responses as recommended by the original SMS-II.
- Secondly, only one subscale was removed. Amotivation was removed because the aim was to measure the motivation for athletes to return to sport as explained in 1.1.2.
- The scale was also translated to Afrikaans in order to make it easier for Afrikaans students to answer the questionnaires in a language known to them. The original English SMS-II was translated to Afrikaans by an independent translator. The translated Afrikaans version (Addendix H) was reviewed and translated back to English by an independent psychologist. The psychologist concluded that the original content was retained and that no ambiguity was present. No changes were made to the translated version.

#### 3.2.5.2.2 Follow-up phone calls

As described in 3.2.6.2, follow-up phone calls were used to determine recurrence of injury. The data was documented on a data sheet (Appendix I).

### 3.2.6 Data collection procedures

The following approaches were followed to collect data from the coaches and the athletes:

#### 3.2.6.1 Data collection from coaches

Unstructured interviews often yield varying information from respondents that is difficult to compare (Silverman in Leedy and Ormrod 2005). Structured questions were therefore asked in interviews (Appendix K) with the track and field coaches, to determine whether there is a need for a type of motivation to be considered by physiotherapists when decisions about RTS are made.

Data was collected from April 2016 to October 2016. A list of all the registered track and field coaches in Bloemfontein was obtained from AFS in Bloemfontein at the end of March 2016 (Swarts 2016). Coaches who were included in the sample (explained in 3.2.3) were telephonically contacted to inform them of the study and to request their participation. A suitable time and venue were agreed upon with each willing coach who complied with the inclusion and exclusion criteria described in 3.2.4.1. Each respondent was personally invited by the researcher to participate in the study. A brief explanation of the study was discussed with the respondent and informed consent (Appendix B) was signed by each respondent. The structured and structured questions (Appendix K) were asked by the researcher and the answers were transcribed by the researcher on the pre-constructed data sheet (Appendix I). Enough time was arranged that all the questions could be answered. After completion of the interview the respondents had the

opportunity to read the transcriptions and alter any answers if they felt that these did not accurately reflect their answers.

### 3.2.6.2 Data collection from athletes

Data about the type of motivation of athletes and re-injury of these athletes was collected from 31 March 2016 to the end of July 2016. Two persons were involved with entries of Free State athletes at all national and international competitions. Injured athletes had to report to them with a medical document for authorisation to withdraw from certain competitions and to request inclusion in later competitions. These two persons were contacted after each national competition/championship by the researcher, in order to identify possible athletes for inclusion in the study. Identified athletes were contacted by the researcher and were then invited to participate in the study.

Participants were contacted telephonically during the last week before RTS to a track and field event on the official fixtures of ASA (ASA 2016). The researcher made an appointment with the participant and organised for a quiet area where the participant completed the adapted SMS-II (Appendix H) and the demographic information on the data-sheet (Appendix I), without any distractions. The researcher briefly explained to the respondent what participation in the study entailed and explained to the respondent that he/she could withdraw from participation in the study at any time. The respondent signed informed consent (Appendix G). The instructions were explained in detail by the researcher to each one of the respondents. The researcher was available to answer any questions that arose, to ensure that the same assistance was given to different respondents when questions about the SMS-II or the data sheet might arise. When the participants had completed the adapted SMS-II, the data sheet (Appendix I) was attached to the completed adapted SMS-II. No personal details appeared on the questionnaires or data sheets.

The respondents were members of the same track and field club, but during the period of the study there was no physiotherapist employed by the UFS or

physiotherapist appointed to treat the athletes of the UFS on campus. Athletes were treated by physiotherapists in private practices of their own choice. The researcher was also involved as a clinician and did treat and clear some of the athletes for RTS using clinical reasoning and RTS-criteria described in Brukner and Kahn (2008). For athletes that were not treated and cleared for RTS by the researcher, the relevant data was obtained from their treating physiotherapists. With the permission of these athletes, the athlete's physiotherapists were contacted to disclose the relevant data for clearance for RTS and the correct medical diagnosis of the athlete's injury. This data was added to the data sheet (Appendix I).

The participants were telephonically contacted by the researcher on a weekly basis for the first month and on a monthly basis for the remainder of the competition season (31 March 2016 to end of July 2016) to determine whether they were competing unhindered by injuries, or whether any of them had experienced a recurrence of injury after RTS. If an athlete had experienced a recurrence of injury, the nature of the injury was also determined from the athlete as either being identical to before RTS, related to the original injury or a new injury that could not be linked to the original injury. This data was added to the data sheet (Appendix I) which was attached to the adapted SMS-II (Appendix H).

### 3.2.7 Pilot study

Babbie (1990) and Sarantakos in Strydom and De Vos (2005) distinguish between a pretest and a pilot study. A pilot study is a "mini walk-through" of the complete study while a pretest is only the execution of a few aspects (e.g. the questionnaire or the interview) of the study. Strydom in De Vos (2005) warns that one of the biggest mistakes made by researchers is to not conduct a pretest or pilot study. A pretest or pilot study improves the accuracy of a research study (McVurney in Strydom in De Vos, 2005).

Pretests and a pilot study were executed to improve the quality of the measurement instruments as advised by Katzenellenbogen (1999). Strydom

(2005) advised that the complete questionnaires should be tested on respondents as close as possible to the populations that had to be included in the study. Pretests were conducted during the last week in March 2016 and a pilot study was conducted in May 2016.

#### 3.2.7.1 Interviews with coaches

The pilot study included one track and field coach at the UFS athletics club in Bloemfontein. The interview took place on 9 May 2016 at a quiet venue. The coach had athletes in her training group who had been members of national teams during 2014 and or 2015. She fulfilled the eligibility criteria stated in 3.2.4.1. The venue was booked for an hour and privacy was guaranteed. The interview was conducted and noted by the researcher. The respondent was requested to comment on the phrasing, clarity, order, redundancy and completeness of the questions (Strydom 2005). No changes were made to the structured interview.

#### 3.2.7.2 Athletes - SMS-II and data sheet

The adapted SMS had already been successfully used in the study of Podlog and Eklund (2005) to measure the motivation of athletes to RTS. The athletes investigated by Podlog and Eklund (2005) also included track and field athletes competing at international and national level. The athletes' ages also ranged between 18 and 44. Although athletes from other sporting codes, as well as less experienced athletes who competed only at provincial level were also inlcluded, the population and sample compared well with this study. No further changes were suggested by Podlog and Eklund (2005) to measure motivation of athletes to RTS. Similar changes to the changes made by Podlog and Eklund (2005) to the SMS were applied to the SMS-II (refer to 3.2.5.2).

Buchberger (2012) explained that very few elite athletes complete a season completely symptom-free. Athletes older than 18 years training at the UFS-track and field club were approached during the last week in March 2016 and

were requested to participate in the pretest if they had minor injuries or niggles that did not prevent them from participation at competitions, but did influence their training to such an extent that they were not able to complete their sessions. Six athletes (five Afrikaans and one English) were included in the pretest. The athletes who preferred the Afrikaans version of the SMS-II received the translated version to complete and the one athlete that preferred the English version received the English version of the SMS-II to complete.

According to Strydom (2005) respondents should be requested to comment on the phrasing, clarity, order, redundancy and completeness of the questions and/or items. No changes were necessary to the measuring instruments.

The data and findings of the pilot study in 3.2.7.1 above were included in the study because the respondents satisfied the inclusion and exclusion criteria stipulated in 3.2.4.1. The data and findings of the pilot study in 3.2.7.2 were not included in the study because they had only minor injuries which did not prevent them from participation (refer to inclusion criteria in 3.2.4.2).

## 3.3 Measurement and methodology errors

The validity of the measuring instrument is the measure of the extent to which the instrument measures what it is supposed to measure (Leedy and Ormrod, 2005, Maree, 2012). Reliability is the consistency of a measuring instrument to deliver a specific result (2005). The following important factors were considered to minimise possible measurement and methodology errors during the collection of data.

### 3.3.1 Interviews with coaches

A structured interview (Appendix K) was compiled because unstructured interviews require exceptional skills and experience (Leedy and Ormrod 2005). Leading interview questions were avoided in order to ensure an insightful interview (Shank in Leedy and Ormrod 2005).

A pilot study was carried out on one of the coaches at the UFS identified for possible inclusion in the study (refer to 3.2.7.1). The same researcher interviewed all five respondents involved in the main study as well as the one respondent involved in the pilot study. Sufficient time was allowed for the respondents to participate in the interview. The transcriptions were presented to the respondents for approval immediately after completion of the interviews.

Coaches were interviewed during May to October 2016. The same researcher interviewed all the respondents in this study. Interviews took place in similar quiet conditions with as minimal as possible distractions. The researcher gave the same guidance regarding the questions to all the respondents, but was willing to explain any aspect about the question that was not clear to the respondent.

Sufficient time was allowed for the interviews with the coaches to ensure that respondents did not feel rushed to answer the questions (Gillham 2000). From the pilot study it was confirmed that 30 minutes was sufficient to allow respondents to answer all the questions in the interview. It was decided to allow at least 60 minutes for the interview to ensure that the respondents were relaxed during the interview.

Lastly, approval was obtained for the use of the structured questionnaire for the interview, from the Department of Biostatistics, the School for Allied Health Professions Evaluation Committee and the Health Sciences Research Ethics Committee of the UFS (Appendices D, E and F).

### 3.3.2 Athletes - SMS-II and data sheet

Pretests were carried out on six athletes from the UFS athletics club during the last week of March 2016. No changes to the measuring instrument were necessary. Approval for the use of the adapted version of the revised SMS-II as well as the data sheet was obtained from the Department of Biostatistics,

the School for Allied Health Professions Evalution Committee and the Health Sciences Research Ethics Committee of the UFS (Appendices D, E and F).

Sufficient time was arranged for the respondents to answer the 15 items of the SMS-II and to complete the data sheet. The researcher was available during the completion of the SMS-II and the data sheet in order to clarify any queries from the respondents. The adapted revised version of the SMS-II was available in Afrikaans and English to allow for personal preference regarding the two languages.

According to Pelletier *et al.* (2013) researchers recently questioned some of the item contents and psychometric properties of the SMS. As described in 2.7.2 the revised version of the scale (SMS-II) that consists of 18 items was compiled to measure the motivation for sport participation. The revised version was used for this study. Similar adaptations to those used by Podlog and Eklund (2005) to the SMS, were applied to the SMS-II to ascertain athletes' motivations to RTS after an injury. Similar information needed to be obtained in this study by means of the adapted SMS-II (refer to 3.2.5.2.1). The original SMS had a good reliability and construct validity (refer to 2.7.1). The SMS-II was examined and the different subscales performed equally, if not better than the original SMS (Pelletier *et al.* 2013). The reliability of the SMS-II was further increased by emphasising the importance of honest replies by the respondents, in order to prevent guessing that can influence the reliability of the instrument (Leedy and Ormrod 2005).

From the pilot study it was clear that 20 minutes was sufficient for respondents to complete the SMS-II as well as the data sheet. The respondents were requested to prepare for approximately 30 minutes to complete the SMS-II and the data sheet.

In order to limit the fall-out of respondents, a minimum number of people was used to engage with the respondents. The researcher contacted the two people responsible for entries at athletics meets in order to identify

participants for the study and personally contacted each respondent during the study.

The physiotherapist who treated the participants provided clearance for RTS and a medical diagnosis for the injuries that the athletes had before RTS. Obtaining this information from a medical professional increased the reliability of the diagnosis of the athlete. It also improved the validity of the data on the injury of the athlete who is about to RTS, as the diagnosis was provided by the same medical professional who treated the athlete and cleared the athlete for RTS.

## 3.4 Data handling and analysis

Contributing to the validity and reliability of the results, the coding of the SMS-II, data sheets and the interviews was attended to by the researcher according to the instructions of the Department Biostatistics at the UFS. The coding was checked by the researcher for possible errors. The data was entered and re-entered on a Microsoft Excel spreadsheet according to the instructions of the Department of Biostatistics.

The statistical processing of data was done by the Department of Biostatistics at the University of the Free State, using SASS software. Descriptive statistics, namely averages and standard deviations of medians and percentiles for continuous variables, and frequencies and percentages for categorical variables were calculated. The Kruskal-Wallis test and Wilcoxon two sample test were used to compare the type of motivation of athletes with the re-injury of athletes.

## 3.5 Ethical aspects

Soanes and Stevenson (2004) define ethics as the moral principles governing or influencing conduct. According to Punch (2000), a good study incorporates ethical aspects that might be relevant to the study. The researcher then has to reveal how these aspects were anticipated and dealt with.

The proposal for this study was handed in at the Research Evaluation Committee of the School for Allied Health Professions of the UFS. Permission to continue with the study was granted (Appendix D) and recommendations by the committee were incorporated into the final proposal that was presented to the Health Sciences Research Ethics Committee of the UFS. Approval to start with the study was granted (Appendix E).

Creswell and Clarke (2011) advises obtaining permission from possible gatekeepers to information after ethical clearance. This may include individuals who are in charge of sites, people who provide information and campus-based institutional review boards. Approval for the execution of the pilot study on athletic coaches of the UFS was also obtained from Head of Sport at the UFS (Appendix A), Director Student Life - UFS and Vice-Rector: Research (Appendix C). Approval for execution of the study on coaches and athletes registered with AFS was obtained from the General Manager of AFS (Appendix B).

### 3.5.1 Ethical aspects with regards to the SMS-II and data sheet

According to Leedy and Ormrod (2005) participation in any study should be voluntary. Babbie (2007) suggests obtaining consent from each individual participating in the study. Babbie (2007) also states that the fundamental ethical rule is that there must be no harm for the respondents.

Participants were therefore informed that they could withdraw from the study at any time and that their confidentiality would be guaranteed at all times. An informed consent form (Appendices G and J) was required from each of the participants (refer to 3.2.6.1 and 3.2.6.2). This form was compiled according to the guidelines described by Leedy and Ormrod (2005:102). This informed the participant about the aim of the study and also what participation in the study involved. No names were required on the numbered data sheets (Appendix I) or the uniquely numbered data sheets (Appendices H and K). No contact information appeared on the data sheets. The participants were

notified that no renumeration would be awarded for participation in the study. No costs were involved for the participants.

The physiotherapist who cleared a possible participant for RTS was also required to sign the letter of consent (Appendix G) of the specific athlete for inclusion in the study.

The researcher's contact information was provided to the respondents in the event of any possible further enquiries about the study and/or the results of the study.

### 3.5.2 Ethical aspects with regards to the interviews

Confidentiality is explained by Babbie (2007) as a guarantee by the researcher that responses will be identified only by the researcher and not by the public. Participants in the interviews were guaranteed confidentiality. Respondents were not forced to participate in the study and they were informed that they could withdraw from the interview and study at any stage (Babbie 2005). Each one of the respondents was expected to sign an informed consent letter (Appendix J). Manson and O'Neill (2007) warns that research without the consent of the respondent is likely to breach ethical norms. The researcher especially ensured that no questions that could cause personal damage to the respondents were asked, for example questions that could cause the coach to feel responsible for athletes who RTS too soon (Babbie 2005). Anonymity was also guaranteed with the dissemination of the information, in order to make the respondents feel even safer to participate in the study.

Contact information of the researcher was provided should participants have any questions relating to the study or the results of the study.

## 3.6 Conclusion

In this chapter all the aspects regarding the research methodology pertaining to this study were discussed. The processes used to gather information from coaches, physiotherapists and athletes regarding motivational aspects of RTS and re-injury were discussed here. The results obtained from this study are discussed in detail in chapter 4.

# *Chapter 4*
# RESULTS

## 4.1 Introduction

In this chapter the results obtained form this study are explained in detail. The results obtained from the structured interviews with coaches (Appendix K) as well as the results obtained from the adapted SMS-II and data sheets (Appendices H and I) will be presented separately.

## 4.2 Results from the interviews with coaches

The results of the structured interviews are discussed according to the order of the questions in the structured interview namely:

i. general coaching experience and involvement
ii. coaches' expectations of physiotherapists
iii. referrals and
iv. identifying the need for motivation to be considered before an athlete is cleared for RTS.

### 4.2.1 General coaching experience and involvement

Three male and three female coaches were interviewed. These coaches registered with AFS, were identified for inclusion - as explained in 3.2.2.1. The coach with the least amount of coaching experience had 15 years' experience compared to the coach with the most experience, who had 48 years' coaching experience. The mean years of experience was 26.3 with a standard deviation (SD) of 12.4 years. All six coaches considered themselves more involved with coaching track and field than any other sport. Only one coach was also involved in coaching cross country and one coach was involved in coaching biathlon, triathlon and biathle.

Some of the coaches had experience in more than one specialist area but all six of them had experience in all five specialist areas of track and field. The collective experience of the coaches is presented in Figure 4.1.

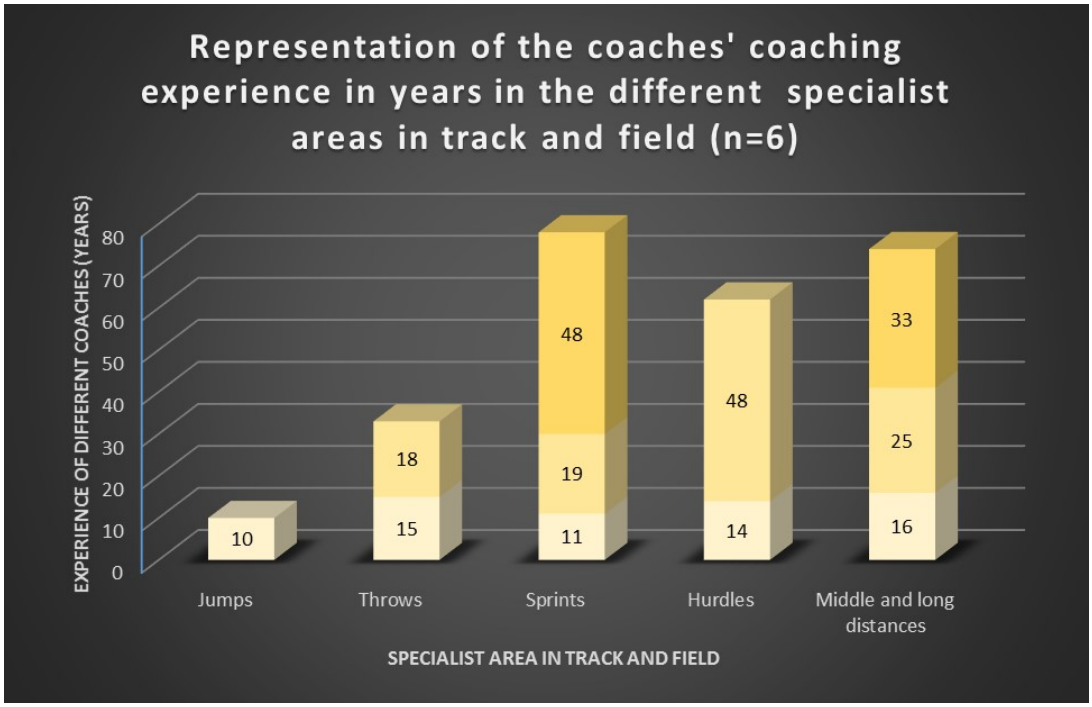


***Figure 4.1 Representation of the coaches' coaching experience in years in the different specialist areas in track and field (n=6).***

Only one coach had experience in coaching the jumps for 10 years, but three of these coaches had experience in coaching sprints, with a total of 78 years of coaching experience between these three coaches. Three of the coaches had experience in coaching middle and long distances, two coaches had experience in coaching throws and two, in coaching the hurdles events.

As explained in 2.2.2 and 2.2.3, athletes can represent their province in five different age groups but their country, in only three of these five age groups. The coaches had athletes in their training groups across the age groups and some of these athletes represented South Africa. The distribution of the age groups and provincial and national representation during the 2014/2015 season in the coaches' training groups are presented in Table 4.1. Four of the coaches coached senior athletes who represented the country at international events during the 2014/2015 season. All six coaches coached

senior athletes who represented their province at national events in track and field during the previous season (2014/2015). Five of the coaches had junior athletes who represented their province at national events, in their training groups and only one of the coaches had an athlete in the youth category, who represented the country at international events.

***Table 4.1 Representation of the age group distribution and team representation of the athletes coached by the coaches (n=6) during the 2014/2015 season.***

| Age Groups | Provincial | National |
|---|---|---|
| **Sub youth** | 4 | |
| **Youth** | 4 | 1 |
| **Junior** | 5 | 2 |
| **Under 23** | 5 | |
| **Senior** | 6 | 4 |

### 4.2.2 Coaches' expectations of physiotherapists

When asked who was responsible for most of the decisions regarding RTS of athletes in their training groups, most of the respondents (three) indicated that physiotherapists were more often responsible for RTS decisions compared to sport doctors (see figure 4.2). The blue colours used in figure 4.2 represent parties that were responsible for most of the RTS decisions for athletes while the red colours represent parties that were never involved in RTS for athletes in the training squads of the involved coaches. This was represented on a continuum from 1 to 9 and a gradual change from blue to green to red. Two of the respondents preferred sport doctors to make RTS decisions and one of the coaches preferred him/herself to make the RTS decisions.

Teachers or the persons in charge of athletics at the school or club and parents or guardians of the athlete were the least likely to make RTS decisions at the six respondents' training groups. Two respondents preferred

that teachers or the persons in charge of athletics at the school or club make no RTS decisions at their training groups and another three respondents indicated that they should make the least number of RTS decisions at their training groups. Two respondents indicated that parents or guardians should not have a say in RTS decisions at their training groups, but one of the respondents did value the RTS decisions of parents, allocating a third position to parents or guardians as regards RTS decisions.

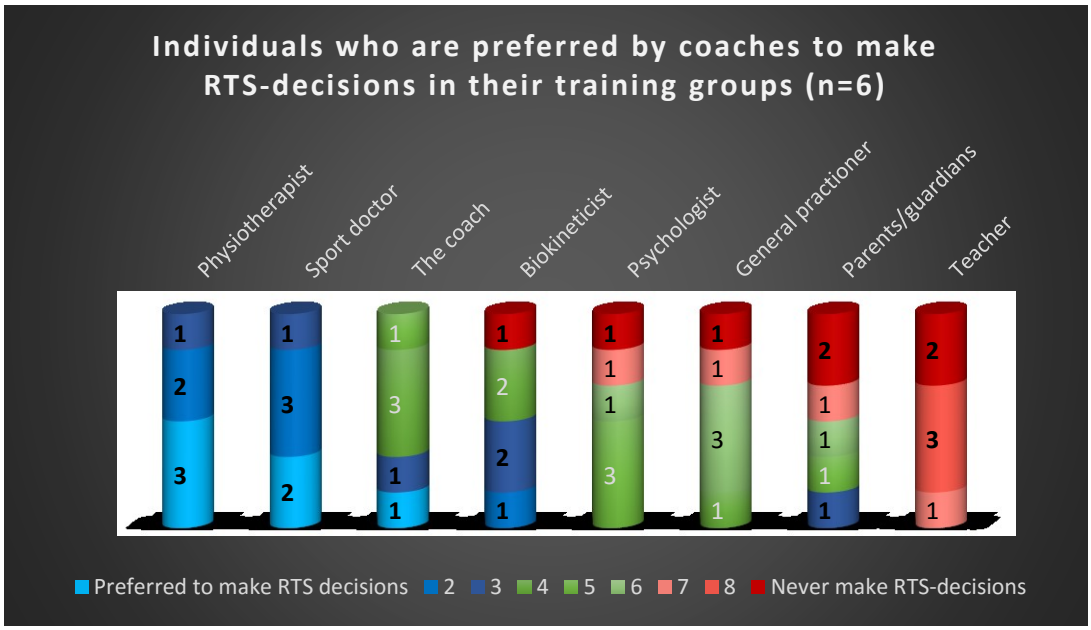


***Figure 4.2 Individuals who are preferred by coaches to make RTS-decisions in their training groups (n=6).***

From Figure 4.3 it is clear that most of the respondents would prefer to have a physiotherapist, a sport doctor and the coach present when an athlete is injured during a competition and a decision needs to be made about the continuation of participation of the specific athlete. One of the respondents would also like to include the parent/guardian in this decision.

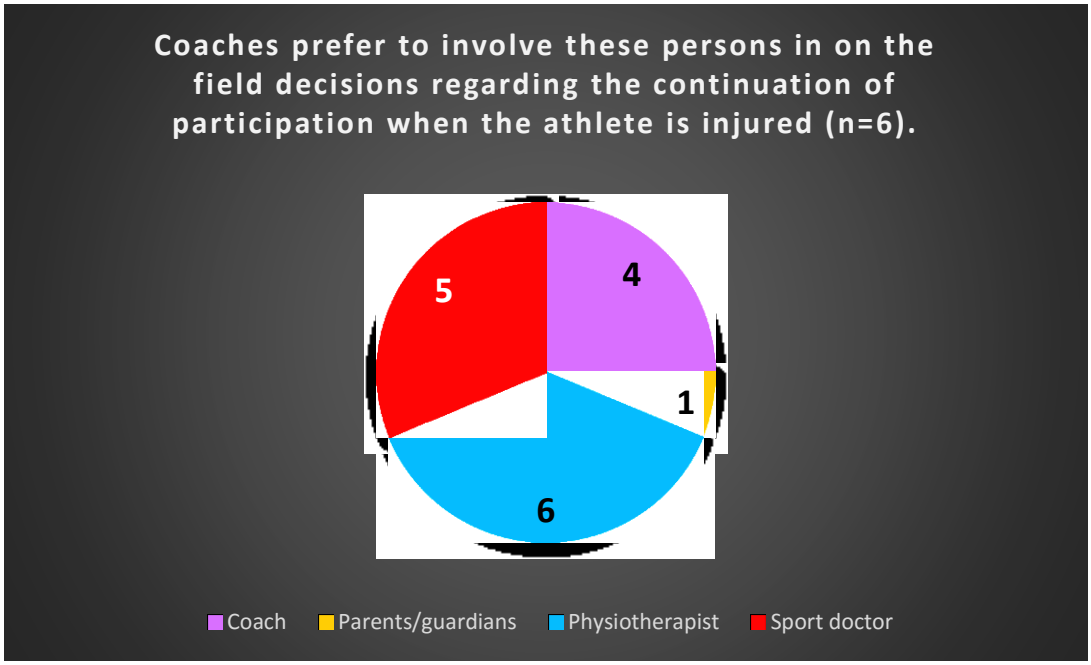


***Figure 4.3 Coaches prefer to involve these persons in on the field decisions regarding the continuation of participation when the athlete is injured (n=6).***

In Table 4.2 the expectations of coaches of a physiotherapist who treats one of their athletes are represented. All six respondents expected physiotherapists who treat their athletes to identify possible areas that may lead to injuries during the season. One of the coaches mentioned that if these areas could be communicated to the coach, the coach could adapt his/her training programme in order to prevent injuries.

***Table 4.2 Coaches' expectations of a physiotherapist treating one of their athletes (n=6).***

| | Yes | No |
|---|---|---|
| To evaluate athletes in the pre-season to identify possible areas that may lead to injuries during the season. | 6 | 0 |
| To decide when the athlete is ready to return to training. | 6 | 0 |
| To at all cost prevent the athlete from returning to sport if there is even the slightest possibility that the injury can worsen. | 6 | 0 |
| To provide advice about the handling of the athlete during training sessions in order to prepare the athlete for return to participation in sport. | 6 | 0 |
| To decide when the athlete is ready to return to participation in sport. | 5 | 1 |
| To provide advice on how to prevent the athlete from suffering similar injuries in future. | 6 | 0 |
| To use the necessary modalities (e.g. strapping), to assist athletes with minor injuries to participate in sport. | 5 | 1 |
| To evaluate whether an athlete is not only physically ready, but also psychologically ready to return to sport. | 5 | 1 |
| To determine what the motivation for the athlete is to return to sport. In other words, is it really the athlete who wants to return to sport? | 6 | 0 |

All the respondents indicated that they expected the physiotherapist to decide when the athlete is ready to return to training. They also expected the physiotherapist to at all cost prevent the athlete from RTS if there was even the slightest possibility that the injury could worsen. One of the respondents did remark that this decision should be made in conjunction with the athlete's biokineticist. All six the coaches expected the physiotherapist to provide advice about the handling of the athlete during training sessions in order to prepare the athlete for return to participation in sport. One of the respondents

also expected the physiotherapist to guide the coach with suggestions about the intensity at which the athlete could safely train. Five of the respondents indicated that they expected the physiotherapist to decide when the athlete was ready to return to participation in sport. One of these respondents did mention that this decision should be taken consulting with the coach and another explained that he/she would expect this only if the physiotherapist had a keen interest in track and field.

All the respondents expected the physiotherapist to provide advice on how to prevent the athlete from suffering similar injuries in future. One of the respondents stated that they expected the physiotherapist to identify and also treat the cause of the injury and not only the symptoms of the injury. Five of the respondents expected the physiotherapist to use the necessary modalities (e.g. strapping) to assist athletes with minor injuries to particpate in sport. One of the respondents stated that these modalities should be applied only if it would not be risky for the athlete to compete. The coach who did not expect the physiotherapist to use strapping, stated that an athlete who needs strapping to compete should not compete at all.

Five of the respondents expected the physiotherapist to evaluate whether an athlete was also psychologically ready for RTS and the sixth respondent said that he/she did not expect it from the physiotherapist, but that it would be of great help if the physiotherapist were able to disclose that information. One of the coaches mentioned that the physiotherapist would be better equipped and experienced than a coach to evaluate whether the athlete was hiding any injuries. All six coaches expected the physiotherapist to determine what the motivation for the athlete was to RTS. Two of the coaches reasoned that the athletes might disclose to their physiotherapists if they felt pressured to RTS due to pressure from their parents and/or sponsors.

### 4.2.3 Referrals

The respondents were asked to which professionals they would refer athletes with specific complaints. There responses are illustrated in Figure 4.4. More respondents prefered to refer athletes to a physiotherapist if they had complaints or injuries to their muscles, joints or ligaments. Sport doctors were the only other first-line practitioners mentioned for referrals for these complaints. Equal amounts of respondents preferred to refer athletes to sport doctors and physiotherapists when the athletes had nerve related injuries or complaints. Five of the respondents preferred to refer their athletes to a psychologist or sport psychologist if they struggled with motivation, but the sixth respondent mentioned that he/she would rather refer the athlete to another athlete who had previously struggled with the same problem.

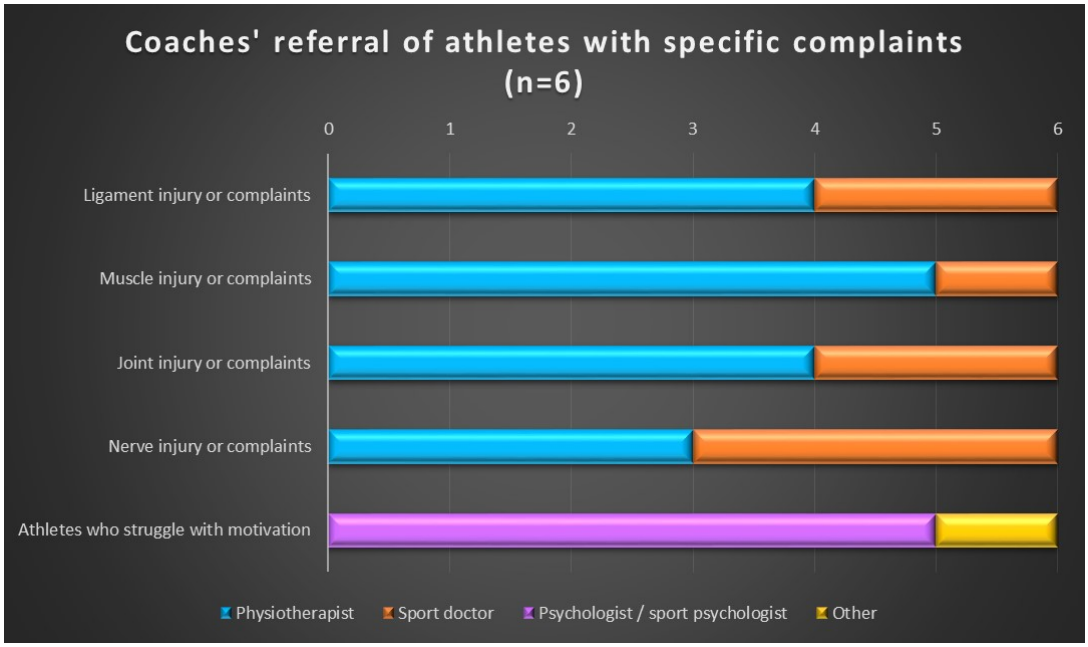


***Figure 4.4 Coaches' referral of athletes with specific complaints (n=6).***

### 4.2.4 Identifying the need for motivation to be considered before an athlete is cleared for RTS

Motivational factors that can influence decisions regarding RTS are discussed in 2.6.3. The responses concerning the importance of these factors in decisions regarding RTS according to the respondents are illustrated in Figure 4.5.

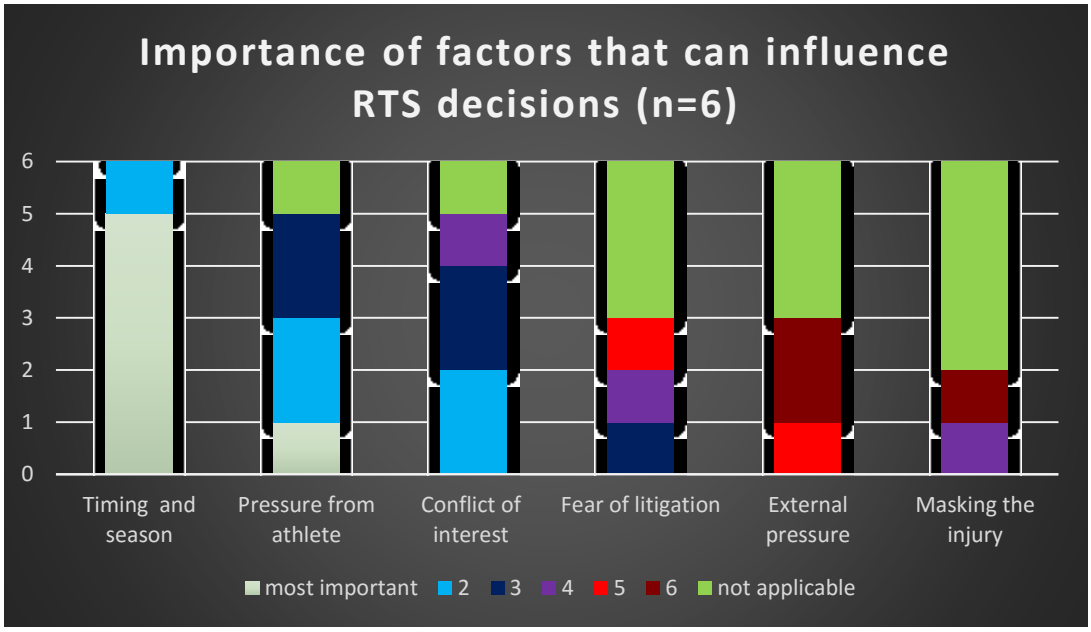


***Figure 4.5 Importance of factors that can influence RTS decisions (n=6).***

Five of the respondents considered *timing and season* as the most important factor that can influence RTS decisions. *Pressure from the athlete* was indicated as the second most important factor that could influence RTS decisions, with one respondent indicating it as the most important, two respondents placing it second and two respondents placing it third.

*Masking the injury* and *external pressure* were the least important factors, according to the respondents. Four of the respondents indicated that they would not consider masking injuries with, for example, analgesics and they chose to describe this factor as 'not applicable'. Three respondents each decided to allocate 'not applicable' to *fear of litigation* and *external pressure*.

All six of the respondents indicated that they were of the opinion that their elite athletes often return to participation in sport too soon due to pressure from persons, sponsors or institutions. All six respondents also indicated that a recommendation regarding the type of motivation of an athlete to RTS will *always* be of value to them, as coaches. The respondents motivated their answer with statements like "*because it would be in the best interest of the*

*athlete*", "*teamwork is important in managing an elite athlete*" and "*you always try to do the best for your athlete".*

## 4.3 Results from the adapted SMS-II and data sheets

The results of the athletes will be discussed in the following order:

i. General and demographic information about the athletes (Appendix I)
ii. Diagnostic and RTS information about the participants (Appendix I)
iii. Type of motivation of the athletes (Appendix H and I)
iv. Re-injury of the athletes (Appendix I).

### 4.3.1 General and demographic information about the athletes

Forty percent of the participants in the study were female and 60% were male. All participants were between the ages of 18 and 25 on the date that they entered the study, with the mean age of the respondents 20,67 years with a SD of 2,05.

The participants had to indicate to which specialised event(s) they were about to return to and intended to compete in for the remainder of the season. The participants indicated anything from one to three different specialised events and the number of athletes per specialised event is illustrated in Figure 4.6.

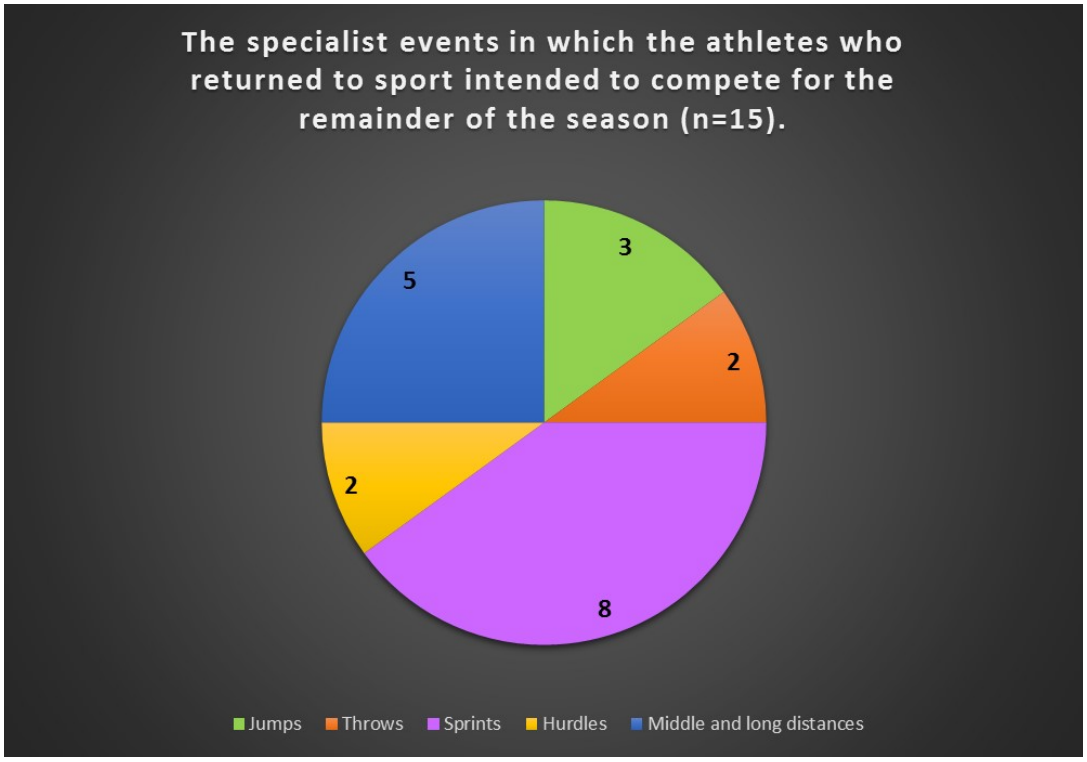


***Figure 4.6 The specialist events in which the athletes who returned to sport intended to compete for the remainder of the season (n=15).***

Eight athletes intended to return to the *sprint* events, five to *middle and long distances*, three to the *jumps*, two to the *throws* and two to the *hurdle* events. Sixty-seven percent of the participants were provincial athletes and 33, 3% of the participants were national athletes and represented the country during the 2014/2015 season. The athletes competed in track and field, on average for 10.07 years (SD of 3.63).

### 4.3.2 Diagnostic and RTS information about the participants

The diagnoses of the participants were provided by the physiotherapists who treated the patients before RTS (illustrated in Figure 4.7). Four participants were diagnosed with grade 1 biceps femoris muscle strains and two of the participants were diagnosed with grade 1 adductor magnus muscle strains. All the other participants had unique different diagnoses.

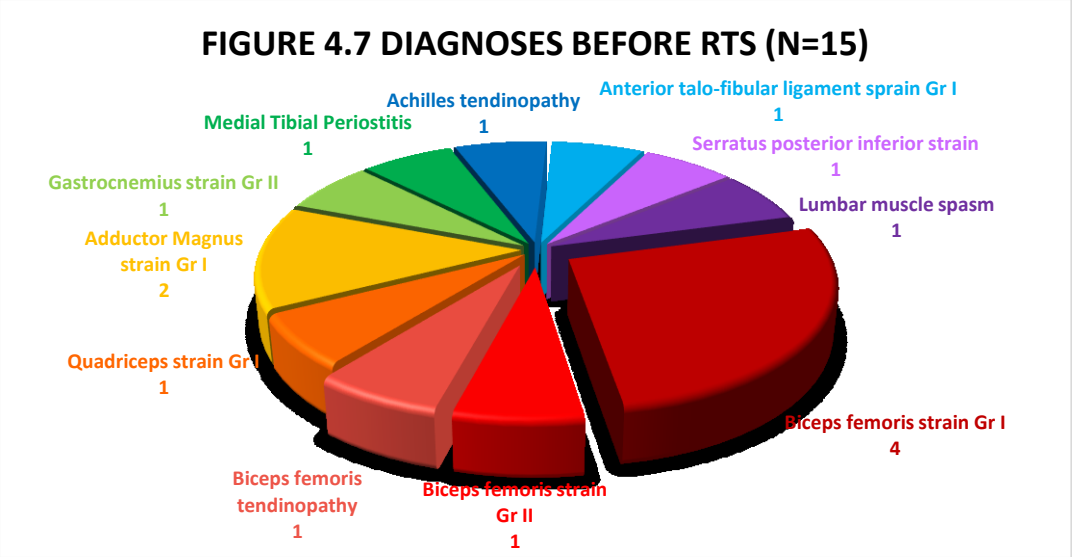


***Figure 4.7 Diagnoses before RTS (n=15).***

Both of the participants who returned to the throw events had injuries of the upper body. Sixty three percent (n = 5) of the participants who returned to the sprint events had hamstring injuries. The participants who returned to the jumps were treated for tendon and ligament injuries of the lower limb and one of the participants was treated for a hamstring strain. Forty percent (n = 2) of the participants who returned to the middle and longer distances were treated for overuse injuries of the distal lower limb.

The participants were treated for their injuries between two and 32 weeks before RTS with the median value, six weeks. Seventy three percent (n = 11) of the participants were previously treated for similar types of injuries.

### 4.3.3 Type of motivation of the athletes (Appendix H and I)

Eighty percent of the participants mentioned that they themselves, together with their coaches, were responsible for the final decision to return to participation in track and field. All fifteen of the athletes were recipients of bursaries from the UFS and two of these athletes had further contracts with companies who provided further sponsorships. When asked if there was external pressure to return to participation, only one of the athletes mentioned

that his/her parents pressured him/her to RTS, three of the athletes were pressured by their coaches to RTS and only one felt that the university pressured them to RTS.

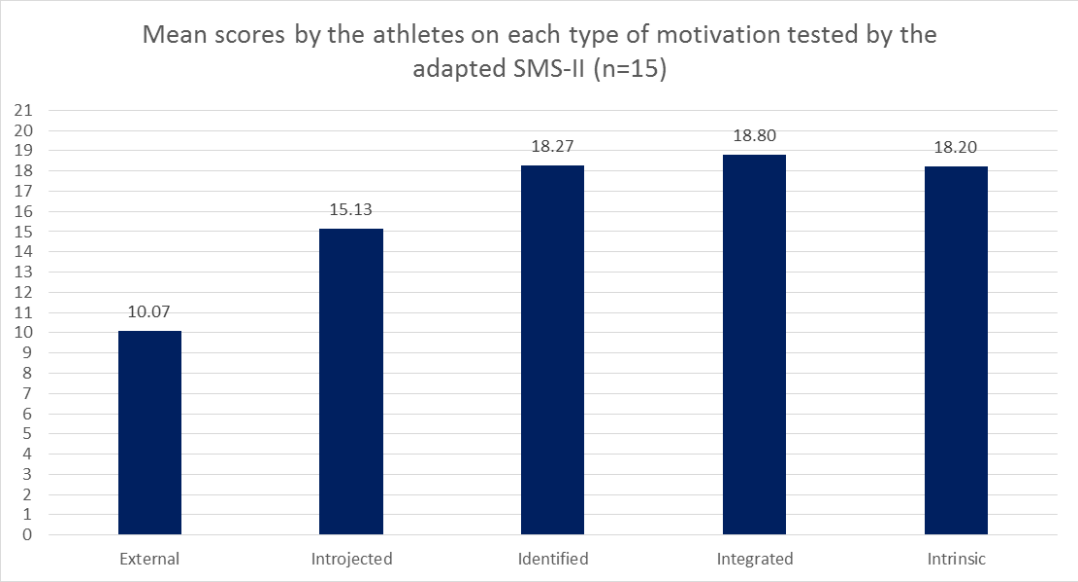


***Figure 4.8 Mean scores by the athletes on each type of motivation tested by the adapted SMS-II (n=15).***

Represented in Figure 4.8 are the mean scores for the different types of motivation of the athletes before RTS. Athletes can obtain a maximum of 21 for each type of motivation.

The population tested high on integrated (average 18, 80 and SD of 1, 47), identified (average 18, 27 and SD of 1, 98) and intrinsic (average 18, 20 and SD of 2, 34) motivation. The population, however, tested lower on introjected (average 15, 13 and SD of 3, 93) and the lowest on external (average 10, 07 and SD of 3, 33) motivation. The respondents scored lowest for external motivation and the maximum score for the respondents' external motivation was 14. The respondents tested highest on integrated motivation and the minimum score for the respondents' integrated motivation was 17. These results indicate that athletes mainly had motivation for RTS that can be perceived as internal (see figure 2.7).

### 4.3.4 Re-injury of the athletes (Appendix I).

Forty-seven percent of the respondents in this study were re-injured within the first three months after RTS. The time of re-injury and the nature of the injuries are represented in Table 4.3.

***Table 4.3 The time after RTS for re-injury to occur for seven of the respondents and the nature of this re-injury (n=15).***

| | | Nature of injury | | |
|---|---|---|---|---|
| **Time when re-injury occurred** | | **Identical** | **New** | **New but related** |
| **First month** | **First week** | 1 | | |
| | **Second week** | 1 | 1 | |
| | **Third week** | | | 1 |
| | **Fourth week** | | 1 | |
| **Second month** | | | | |
| **Third month** | | 2 | | |

Five of the respondents were re-injured within the first four weeks after RTS. Two of these respondents experienced new injuries that could not be linked to the injury before RTS. One of the athletes that returned to the throw events, one athlete that returned to the hurdles events, two athletes that returned to the sprint events and one athlete that returned to a jump event were re-injured within the first four weeks of RTS. None of the athletes were re-injured during the second month after RTS. Two of the respondents had a successful RTS but reported injuries identical to before RTS, three months after RTS. This will be further discussed in 5.3.3.

Similar mean values for the adapted SMS-II scores for the different types of motivation were obtained from the respondents who were re-injured, compared to those who were re-injured as represented in Figure 4.10.

Respondents with injuries had higher mean values for all five types of motivation. The difference in mean values (mean value for athletes who were not re-injured subtracted from the mean value for athletes who were re-injured) for externally motivated (2.29) and introjected motivation (2.16) were greater than the difference for identified (0, 30), integrated (0, 64) and intrinsic motivation (0, 16).

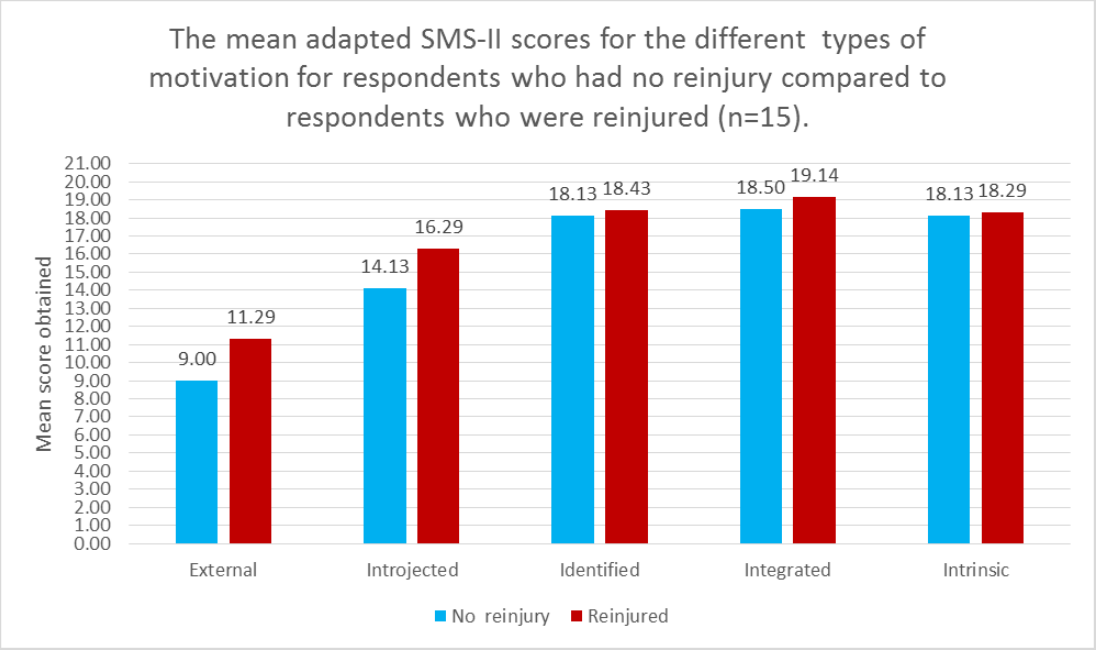


***Figure 4.9 The mean adapted SMS-II scores for the different types of motivation for respondents who had no re-injury compared to respondents who were reinjured (n=15).***

The statistical meaning of these scores for the types of motivation for respondents with no re-injuries compared to those with re-injuries, are represented in table 4.4. The p-values ranged between 0, 1368 and 1,000 and no statistical significant differences ($p<0.05$) were found.

***Table 4.4 The p-values for the different types of motivation of respondents with no re-injury compared to respondents with re-injury after 1, 2 and 3 weeks and 3 months.***

| **Type of motivation** | **p - value** | | | |
|---|---|---|---|---|
| | **1 week** | **2 weeks** | **3 weeks** | **3 months** |
| External | 0,1607 | 0,9266 | 1,000 | 0,1986 |
| Introjected | 0,9072 | 0,9267 | 0,4642 | 0,4145 |
| Identified | 0,2390 | 0,6422 | 0,1368 | 1,0000 |
| Integrated | 0,1744 | 0,7682 | 0,7548 | 0,2170 |
| Intrinsic | 0,7251 | 0,7811 | 0,1869 | 0,8147 |

In conclusion the main findings in this chapter were that all the coaches expressed a need for the type of motivation of an athlete for RTS to be considered by physiotherapists during RTS-decisions. According to the coaches the *timing and season* were considered the most important factors that could influence RTS-decisions and *pressure from the athlete,* the second most important factor. Athletes with extrinsic motivation can therefore apply sufficient pressure on coaches during the correct time of the season and consequently, modify RTS-decisions. The elite athletes who were part of this study, scored higher on the types of motivation that can be perceived as internal motivation. Athletes who were re-injured, however, compared to athletes who were not re-injured, scored higher on the types of motivation that can be perceived as external types of motivation. These differences had no statistical significance and can merely be considered a possible trend. An in-depth discussion of these results and the relevance of these results are discussed in the following chapter.

# *Chapter 5*
## DISCUSSION, LIMITATIONS AND RECOMMENDATIONS

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### 5.1 Introduction

The results of *Return to Sport after Injury: The relationship between an athlete's type of motivation and a recurrence of injury* is discussed in a similar order to the presentation of the results in chapter 4. The type of motivation of an athlete to RTS to be considered, is followed by a comparison discussion of the type of motivation of elite athletes to RTS and the outcome of their RTS regarding re-injury (refer to Figure 5.1).

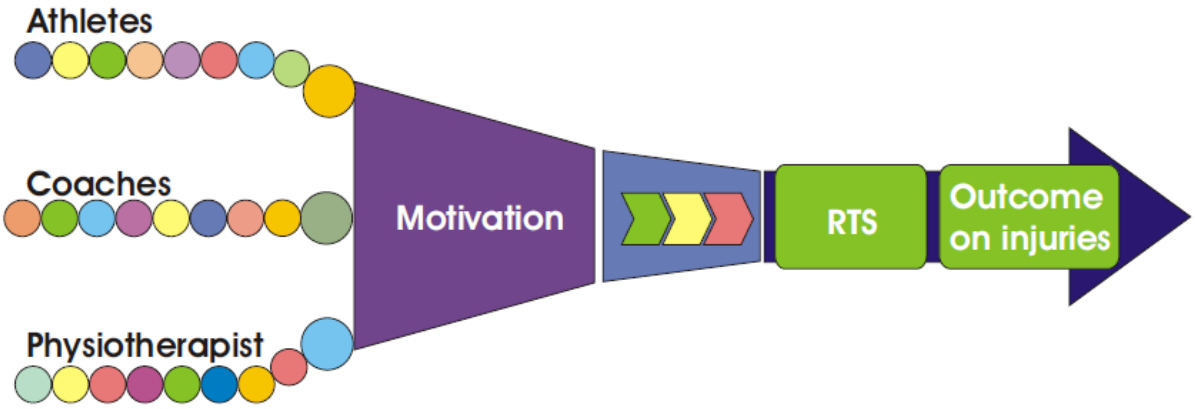


***Figure 5.1 Integration of aims and objectives***

Possible reasons for the results are discussed and the limitations identified during the execution of this study are also highlighted. Further recommendations are made based on the results in chapter 4 as well as the findings from the literature study (Chapter 2).

### 5.2 Interviews with coaches

The athlete's training and performance is the direct responsibility of the coach (Brukner and Kahn 2008). Due to this responsibility and the relationship between a coach, the physiotherapist and the athlete (refer to Figure 2.2) it is imperative to consider the coaches' views on motivation in this study. It was mentioned in 3.2.2 that six coaches were included in the study. These six

experienced coaches have coached elite provincial and national athletes, representing all the different specialist areas in track and field during the 2014/2015 season (refer to Figure 4.1).

### 5.2.1 Variables that could have influenced the results from the interviews with the coaches

All the respondents had experience in coaching track and field events, with the years of coaching experience ranging between 15 and 48 years. Most of the respondents focussed all their coaching attention on track and field with only one of them also coaching cross country and another also coaching biathlon, triathlon and biathle.

All six respondents had junior and senior provincial and national athletes in their training groups (see table 4.1) that corresponded with the population of athletes included in the second part of the study (compare 3.2.2.2 and 2.2.2). The respondents were therefore experienced and coached track and field athletes of similar age groups to the athletes involved in the second part of the study.

### 5.2.2 The coach, the athlete and the physiotherapist

The relationship and trust between a coach, physiotherapist and athlete are represented by Figure 2.2. Trust and communication between these three involved parties were explained in 2.3.1. Similar to the literature discussed in 2.3.1, most of the decisions regarding RTS in the training groups of the respondents were made by physiotherapists (see Figure 4.2).

As mentioned in 2.3.1.2, physiotherapists in Bloemfontein are involved in inter-disciplinary teams that make RTS decisions as part of teams but also have the authority to make these decisions independently (Erasmus *et al.* 2014). From the literature it is clear that coaches trust physiotherapists to make RTS decisions independently (see 2.3.1.2). The coaches further mentioned the importance of the involvement of sport doctors and the

coaches themselves as participants in decision-making regarding RTS (4.2.2). Podlog and Eklund (2007) identified the need and benefits of an on-site physiotherapist as concerns RTS. This may include advice and guidance to athletes training under their coaches. Hayden and Lynch (2011) supported a close relationship between the physiotherapist and coach and also explained that the physiotherapist can assist the coach to better communicate with the athlete by providing information acquired from the athlete during a session. Podlog and Eklund (2007) did, however, warn against possible conflicting roles and ethical considerations and suggested further research on how these conflicts should be handled. Erasmus *et al.* (2014) established that physiotherapists, biokineticists and sport doctors are the main professionals involved in RTS decisions in Bloemfontein (refer to 2.3.1).

Most of the coaches (83%) did not value the input of parents and guardians as one of the three top involved parties in these decisions, however, one of the respondents did include parents and guardians in decisions regarding RTS. The general response of the coaches to disregard parents and guardians in RTS decisions might be due to the composition of the training groups that included elite junior and senior athletes (see table 4.1) who were older than 18 years. Subsequently, the parents and guardians were not as much involved with the athletes' decisions compared to those of younger athletes. Most of these athletes were independent students at the UFS and boarded in Bloemfontein, away from their support system at home. This was also highlighted by the low mean scores on external regulated (average 10, 07 and SD of 3, 33) and introjected regulated motivation (average 15, 13 and SD of 3, 93) of the respondents in the second part of the research study (see figure 4.9).

#### 5.2.2.1 Decisions regarding continuation of participation

Respondents indicated that they would prefer to have a physiotherapist, a sport doctor and the coach present when an athlete is injured during a competition and a decision needs to be made about the continuation of participation of that specific athlete. This is the ideal composition expressed

by the respondents but might not be possible at all competitions due to financial implications. Coaches regard themselves as key participants in decisions regarding RTS when an athlete is injured during a competition, but also when an athlete RTS following an injury (refer to figures 4.2 and 4.3). National and international championships are organised with medical staff available at the competition stadia, but this is not the case for provincial and local competitions where the prerequisite is that first aid and emergency care is available and not necessarily medical professionals that can assist with diagnosis (IAAF 2015). Coaches often have to make on the field RTS decisions regarding their athletes when only first aid is available.

#### 5.2.2.2 Coaches' expectations from physiotherapists

Medical clearance from the doctor or physiotherapist is the main expectation from coaches of various sport codes identified by Podlog and Eklund (2007). Similar results were obtained for track and field coaches in this study and all six respondents indicated that they expected the physiotherapist to prevent an athlete from RTS at all cost if there is even the slightest possibility that the injury can worsen (refer to Table 4.2). A coach was quoted in Podlog and Eklund (2007): "...*ultimately, we are bound by the professional decisions of the physio or the doctor. If the physio says don't do something and the coaches feel we can do it, then we [still] can't do it".*

Respondents indicated that they expected physiotherapists to evaluate athletes in the pre-season to identify possible areas that may lead to injuries during the season. Brukner and Kahn (2008) advise physiotherapists to base their approach on a model of potential causative factors for injury. They explain that the systematic model considers the multifactorial nature of sport injuries as well as the time sequence of events leading up to the injury. They advise that this type of analysis helps to identify possible areas that may lead to injuries during the season, in collaboration with the coach and the athlete, and to create a plan to implement preventative measures in order to prevent injuries. One of the respondents in this study mentioned that if these areas

can be communicated to the coach, the coach can adapt his/her training programme in order to prevent injuries (refer to 4.2.2).

All the coaches (n=6) expected physiotherapists to advise coaches on when an athlete is ready to return to training, but also to advise the coach on the handling of the athlete in order to prepare the athlete for return to competition. As mentioned in 5.2.2, this need may be addressed with an on-site physiotherapist who can be actively involved with the coach in the training of injured athletes in order to prepare them for RTS. The presence of an on-site physiotherapist and the accompanying conflicting roles are discussed in 5.2.2 and need further research. For an off-site physiotherapist, this need for advice by coaches also highlights the importance of effective and ongoing communication between the physiotherapist, the coach and the athlete. The involvement of the physiotherapist should not stop when the patient leaves the treatment room to prepare for RTS under the supervision of the coach. The relationship mentioned in 5.2.2 and illustrated in figure 2.2 should ideally be a continuous relationship, even after successful RTS. Five of the six respondents indicated that they expected physiotherapists to decide whether an athlete is ready for return to participation in sport. This can only be accomplished if the physiotherapist is involved in continuous communication with the coach and the athlete, throughout preparation for return to participation. Podlog and Eklund (2007) indicated that coaches consider the guidelines provided by physiotherapists regarding an athlete's limitations and capabilities essential during the period of preparation for full RTS. One of the coaches of this study further explained that it is important that the physiotherapist who provides the guidelines, should be an ex-athlete him/herself. This was also one of the responses in the study of Podlog and Eklund (2007) and it was explained that a physiotherapist who competed in the same sport before, better understands the requirements for participation and return to the particular sport.

All six respondents also indicated that they expected a physiotherapist to provide advice on how to prevent similar injuries in the future. Similar to prevention of injuries discussed above, they also felt that prevention of re-

injury of an athlete should be a joint effort between the physiotherapist, the coach and the athlete (refer to 4.2.2).

Five of the respondents expressed the need for physiotherapists to apply the necessary modalities in order to assist athletes with minor injuries, to compete. The coach who did not express this need was of the opinion that an athlete who needed strapping or other modalities to safely compete, was not supposed to participate until he/she was completely free of injury (refer to 4.2.2). Buchberger (2012) is, however, of the opinion that most of the athletes competing at an Olympic Games are injured and mask the injuries with different modalities.

Lastly, five of the respondents indicated that they expected a physiotherapist to evaluate whether an athlete is not only physically, but also psychologically ready to RTS. The sixth respondent indicated that he/she did not expect it from a physiotherapist, but that it would be an advantage if the physiotherapist were able to evaluate this. All six the respondents indicated that they expected the physiotherapist to evaluate the athlete's type of motivation for RTS. One of the respondents pointed out that: "...*it would be easier for the physiotherapist to evaluate the real reason for the athlete to want to compete again, because the athlete can easily fool me [the coach]*". Two of the respondents explained that the athletes might rather disclose to their physiotherapists if they feel pressured to RTS due to pressure from their parents and/or sponsors (refer to 4.2.2).

### 5.2.2.3 Referrals

Coaches and athletes should have easy referral access to a multidisciplinary team consisting of specific first-line medical professionals for various injuries. This may include sport doctors, physiotherapists, sport psychologists and dietitians (Le Roux 2005). Russell and Tracey (2011) mentioned that both coaches and physiotherapists play an important role in the rehabilitation of both the physical as well as the psychological aspects of an injured athlete. As discussed in 2.3.1.1, Brukner and Kahn (2008) are of the opinion that with

a good relationship between the physiotherapist and the coach, the coach will send athletes with minor complaints to the physiotherapist in order to prevent major problems. The coaches in this study preferred to refer their athletes to a physiotherapist when they have complaints or injuries of their muscles, joints or ligaments (see figure 4.4). The coaches did not indicate a clear favourite professional for nerve injuries and equal amounts of respondents indicated that they will refer athletes to either a sport doctor or a physiotherapist.

Hayden and Lynch (2011) supported the importance of optimal relationships between physiotherapists and coaches and explained that physiotherapists would be in a better position to identify certain qualities of an injured athlete to contribute to other athletes in the training group, even while they are still injured and not ready for RTS. Five of the six coaches preferred to refer their athletes to a psychologist or sport psychologist if they suffered with motivational problems but the sixth respondent indicated that he/she would refer the athlete to another athlete who had a similar experience and had successfully overcome the problem. The coaches expected physiotherapists to evaluate the athletes' psychological readiness to RTS (refer to 5.2.2.2) but did not consider referring an athlete to physiotherapists if they struggled with motivational problems. Although motivational problems are not the primary focus for a physiotherapy session, identifying and addressing motivational problems can be an integral part of the holistic treatment of an injured athlete. Physiotherapists may be responsible for addressing motivational problems, but may not necessarily have the authority to do so (Matheson *et al.* 2011). Tracey (2008) explained that athletes saw their coaches and physiotherapists as an integral part of their emotional and psychological recovery after an injury. Russell and Tracey (2011) did, however, identify a lack of literature on what an injured athlete expects from a physiotherapist regarding psychological support during rehabilitation of an injury.

### 5.2.2.4 Identifying the need for motivation to be considered before an athlete is cleared for RTS

Step 1 of the Decision-based RTS-model discussed in 2.6 is the evaluation of the health status of the athlete who is about to RTS. Step 2 is the evaluation of the participation risk and step 3 is decision modification (refer to Figure 2.3). These factors that can influence and modify decisions regarding RTS are discussed in 2.6.3. The responses about the importance of these factors in decisions regarding RTS according to the respondents are illustrated in Figure 4.5. Five of the respondents considered *timing and season* as the most important factor that can influence RTS decisions. In 2.2.2 the season of track and field in South Africa is explained in order to clarify why athletes can participate in more than one age group at different national championships. This has an influence on the preparation of athletes and especially athletes returning from an injury, and who have to compete at top level at a number of consecutive meets in order to qualify for inclusion in various national teams (refer to 2.2.3). Athletes preparing for international competitions might be under immense pressure to compete and perform at local national meets in order to qualify for inclusion in national teams that participate at international events. This may be why respondents saw *timing and season* as the most important factor that can influence RTS decisions. If the athlete does not compete, the athlete will not be included in these teams. If they compete and sustain minor injuries, they might qualify for a national team, with sufficient time to heal and RTS at one of the international events. *Pressure from the athlete* was the second most important factor identified in this study, that could influence RTS decisions. This pressure from the athlete can be due to intrinsic or extrinsic factors explained in the SDT (refer to 2.7). An athlete who is dependent on the income from participation at international events might be more determined to RTS in order to earn an income, and may RTS too soon.

This may explain why all six coaches indicated that they were of the opinion that their elite athletes often return to participation in sport too soon due to pressure from persons, sponsors or institutions. As explained in 2.7, this behaviour can be described as externally motivated and is the least

autonomous behaviour. It is, however, interesting that none of the athletes who were injured during the second part of the study, scored high on *external motivation* (refer to Figure 4.8). Most of these athletes were coached by the coaches from the first part of the study and it would be expected that this response from the coaches would predict at least some of the injured athletes to score high on external and/or introjected regulated motivation.

From the existing literature discussed in 2.6.3 and research performed by Erasmus *et al.* (2014) on physiotherapists, it is clear that the need for more research on psychological factors as decision modifiers in the Decision-Based RTS model is necessary. Matheson *et al.* (2011) concluded that there is a general lack of research on all three steps of the Decision-Based RTS model, and also speculated that the team physician should not be responsible for all three of these steps. There is controversy especially about the person responsible person for step 3 (refer to 5.2.2.3). According to Matheson *et al.* 2011, currently the team physician may be responsible for step 3 but the physician may not have the authority to be responsible for step 3. Matheson *et al.* (2011) subsequently suggested that more research is necessary on the current responsibilities and authorities of the responsible person in step 3 of the Decision-Based RTS-model. From the results of this study discussed in 4.2.4 it is clear that coaches communicated the need for the type of motivation of an athlete to RTS to be considered during RTS decisions. From the discussion in 5.2.2.3 it is clear that 83% of the coaches preferred psychologists or sport psychologists to address the motivational problems of their athletes. The coaches use motivations like "...*because it would be in the best interest of the athlete...*", "...*teamwork is important in managing an elite athlete...*" and "...*you always try to do the best for your athlete*...".

## 5.3 The type of motivation of elite athletes returning to sport.

All the athletes who participated in the study received bursaries from the UFS or incentives from other institutions in order to assist them with their expenses in track and field participation and training (refer to 4.3.3). This implied that all the participants had factors that could be viewed as external motivation to

perform in their sport. Other factors that could have influenced the results of the elite athletes returning to sport are described below, followed by a critical discussion of the results on the type of motivation of the elite athletes to RTS and the recurrence of injury of these athletes.

### 5.3.1 Variables that could have influenced the results of the elite athletes returning to sport.

The mean age of the respondents was 20, 67 years with a SD of 2, 05. Injured athletes representing all the specialist events in track and field were involved in the study (refer to Figure 4.6). All 15 of the athletes represented their province at national competitions and five of these athletes represented South Africa at international competitions during the 2014/2015 season. These experienced and dedicated athletes competed in track and field on average for 10.07 years (SD = 3.63).

Athletes presented with acute and chronic injuries of various body parts that prevented them from participation in at least one meet before RTS. Throwers presented with injuries of the upper body, 63% of sprinters presented with hamstring injuries, jumpers presented mainly with tendon and ligament injuries and middle and long distance athletes mainly presented with overuse injuries of the distal lower limbs (refer to 4.3.2). Seventy three percent of participants were treated for injuries similar to previous injuries.

Injuries at a young age are known to have sequelae (refer to 2.4). The high percentage of athletes (73%) that were treated for similar injuries to before could have been a reason for re-injury to occur, but it can be seen in the discussion in 5.3.3 below that there were no relevant implications for this study.

All of these factors were considered in the planning of the study and the interpretation of the results. The SMS-II is a newly developed tool to measure motivation. Pelletier *et al.* (2013) expressed the need for the SMS-II to be tested on all ages to examine and confirm the stability of the structure of the

SMS-II. The youngest ages mentioned by Pelletier *et al*. (2013) was a study that confirmed the stability of the instrument for a mean age of 17.41 (SD = 1.77). The ages mentioned by Pelletier et al. (2013) and the age groups explained in 2.2.2 served as motivation for the researcher to exclude athletes who were younger than 18 years from the research study (refer to 3.2.4.2).

Athletes from different specialised events or types of sport present with different types of injuries and the type of sport needs to be considered during the second step of the Decision-Based RTS model (refer to 2.6.2). The specialised event(s) to which the athlete was about to return, was identified and the type of event was compared to the types of injuries that the athletes experienced (refer to 4.3.2).

The respondents were experienced and dedicated athletes from the different specialised events in track and field.

### 5.3.2 The type of motivation of athletes about to RTS

Eighty percent (n=12) of the athletes indicated that they themselves, together with their coaches, usually had the final decision to return to participation in their respective track and field events (refer to 4.3.3). All the respondents were cleared for RTS by a physiotherapist (refer to inclusion criteria at 3.2.4.2). This relates to the answers by the coaches that they expected physiotherapists to make the final decision regarding return to competition (refer to 5.2.2.2). Physiotherapists in Bloemfontein also previously indicated that they were involved in interdisciplinary teams that make decisions regarding RTS (refer to 2.3.1.2), but the type of sport disciplines where these teams were involved, were not specifically mentioned in the study (Erasmus *et al.* 2014).

On-site physiotherapists, as explained in 5.2.2, can be to the advantage of the coaches because the physiotherapist can assist and guide the coaches (a need expressed by coaches – refer to 5.2.2.2) with RTS of an injured athlete. The roles of the coach and the physiotherapists must, however, be

clearly described and ethical issues such as confidentiality need to be cleared in order to prevent tension in the ideal relationship between the physiotherapist, coach and athlete, as illustrated in Figure 2.2.

Athletes involved in this study had an autonomous view on their RTS: even though they all had been cleared for RTS by a physiotherapist, they still felt that the final decision to RTS was their own, together with their coaches. The possible conflicts of beneficence explained in 2.5 should be considered by the physiotherapist in making a RTS decision, but ultimately one should strive for autonomy of the athlete to decide if he/she is ready to RTS. Dammyr (2011) explained that athletes should be nurtured in an environment that supports self-determined behaviour during training and competition. He further explained that this environment can be influenced over time by coaches, parents, other athletes and supporting staff. The respondents in this study also highlighted that very few of them felt pressured by external factors to RTS. The sports medicine model illustrated in Figure 5.2 relates well with the experience of the athletes in this study as regards the athlete and coach who are centred in decisions concerning RTS, and different healthcare professionals who can influence the athlete and coach over time (Brukner and Kahn 2008).

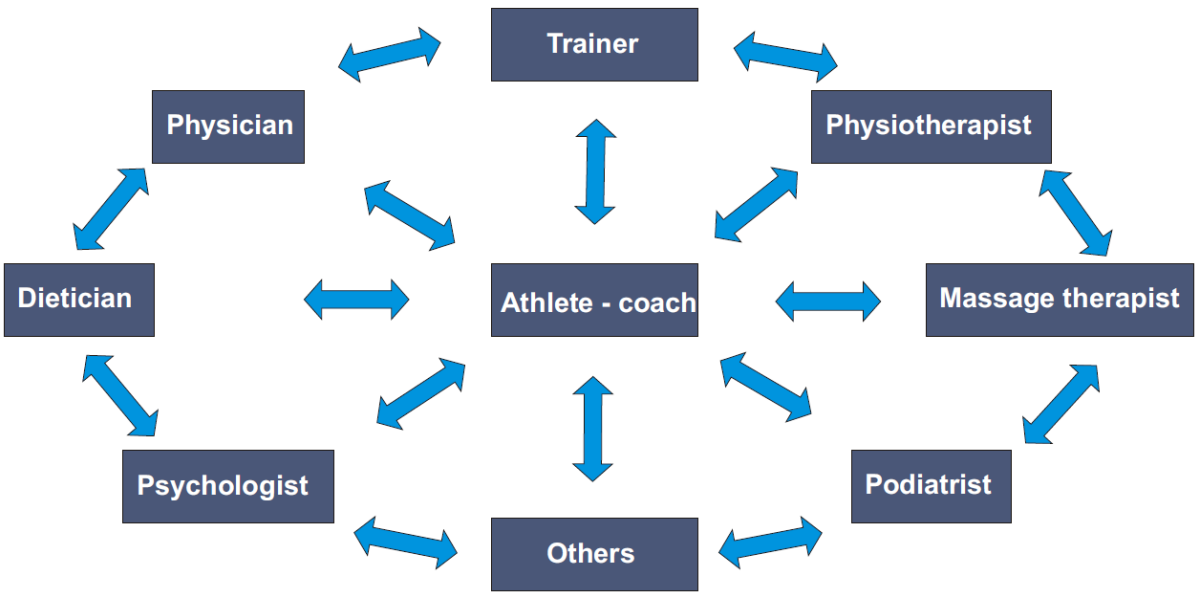


***Figure 5.2 The sports medicine model (Brukner and Kahn 2008)***

The SDT and continuum of types of motivation are explained in 2.7. The respondents in this study tested high on integrated, identified and intrinsic regulation. The respondents, however, tested lower on introjected regulation and lowest on external regulation (refer to Figure 4.8). All the respondents were representing similar types of motivation that leaned more towards the intrinsic type of motivation on the self-determination continuum illustrated in figure 2.7. Identified regulation can be perceived as an internal motivation and RTS will be of personal importance to the respondent who tests high on this regulatory style. Integrated regulation and intrinsic regulation can be viewed as internal motivation and intrinsic regulation of RTS because of the inherent satisfaction, interest and enjoyment of the sport (Ryan and Deci 2000). This is further evidence that the respondents did not feel pressured to RTS from external factors such as coaches, parents and the university or other sponsors - as explained above.

### 5.3.3 Re-injury of athletes

Proper healing of tissue helps to prevent re-injury of the specific tissue, but other factors that contribute to possible injury, such as biopsychosocial factors, also need to be addressed in order to have a successful RTS (refer to 2.4). *Timing and season* was perceived by the coaches in this study as the most important factor that could influence RTS decisions (refer to 5.2.2.4). *Timing and season* was also considered as the most important factor that could influence RTS decisions by physiotherapists in Bloemfontein (refer to 2.6.3) (Erasmus *et al.* 2014). In the inclusion criteria (refer to 3.2.4.2) it was explained that all the athletes had to be cleared for RTS, but the level which these athletes had to return to was at national championship level (refer to 2.2.2). This could mean that athletes, besides from being physically ready, had to be mentally ready to have confidence in the physical abilities of the healed injury, to compete at elite level (refer to 2.4). There was no time to gradually enter participation at less important meets to build confidence in their healing. They had to return immediately to top level participation. The view of the coaches explained in 5.2.2.4 and the lack of research expressed

by Matheson *et al.* (2011) on the factors and components of the Decision-Based model in 2.6.3, motivates for the influence of the competitive level of RTS entry to be more fully investigated.

The athletes in this study (n = 15) were treated between 2 and 32 weeks before RTS (refer to 4.3.2). Only one of the athletes received treatment for more than ten weeks and the rest of the athletes (n = 14) were treated between 2 and 10 weeks with a median value of 6 weeks. Being separated from competition for 32 weeks could have an influence on the motivation of this one athlete to RTS, but none of the athletes had scores for type of motivation that were significantly different from other athletes (refer to 4.3.3) and this lengthy time for treatment did not seem to have an influence on the type of motivation to RTS.

Seventy three percent of the participants were treated for similar injuries before (see 4.3.2). As explained in 2.4, Marchi *et al.* (1999) found that permanent sequelae after sports injuries in specifically children and adolescents is high. Sixty percent of their subjects still had sequelae 12 years after a sport injury incident. This could also contribute to the 46, 67% (n=7) of athletes who were injured within three months after RTS (refer to 4.3.4). A percentage of 13, 33% (n=2) of the respondents had new injuries after RTS that could not be linked to their previous injuries (refer to 4.3.4). Thirty three percent of athletes were re-injured or had injuries that could be related to their injuries that they were treated for before RTS. The athletes that were re-injured could not be categorised to athletes participating in a specific event, nor did they represent athletes with a specific injury. These athletes presented with re-injury that was identical to the original injury before RTS but also athletes who RTS, but experienced injuries that were not related to the injury before RTS.

None of the athletes who returned to sport after injury were reinjured during the second month after RTS. Most of the returning athletes (n = 12) did not compete internationally after RTS and completed their track and field season within one month of RTS. Three of the athletes did continue with an

international season and four of the five athletes that returned to middle and long distances (refer to figure 4.6) switched to cross country. It is clear that the second month after RTS was a time of rest for the athletes that were finished with their track and field season and this explains that there were no athletes that were re-injured during the second month after RTS.

As mentioned in 4.3.4, two of the injured athletes had a successful RTS but were re-injured three months after RTS. Neither of these athletes were included in national teams to compete in international events during the current season (2015/2016). Both of these athletes competed in middle and long distances. Both of these athletes, however, switched from participation in the middle and long distances in track and field to cross country for the winter season. They were injured in a different sporting code of athletics (refer to 2.2.1) and not in track and field. Cross country has a different season to track and field and only starts when track and field finishes. The distances for cross country are longer and the surfaces on which they compete are uneven. Coaches adjust training and the athletes have to run longer distances on uneven surfaces that can prepare them for competition. Sudden adjustments to longer distances and the surface on which the athlete trains are factors that can cause injury (Brukner and Kahn 2008). This could be the reason for the athletes' successful RTS but re-injury with similar new injuries during their participation in cross country (refer to 2.4).

As discussed in 4.3.4, similar mean values were obtained for the adapted SMS-II scores for the different types of motivation by athletes who had no re-injury (n=8) compared to those who were re-injured (n=7). Two of the three athletes who reported that they felt pressure from their coaches to RTS were re-injured, but these two athletes did not score higher on the external regulation and introjected regulation types of motivation, compared to the other athletes who were re-injured. It is possible that the other athletes did not want to report that they felt pressure from their coaches, and that the scores from the measuring instrument revealed similar scores for those athletes who were re-injured and reported that they felt pressured by their coaches, compared to those who were re-injured but did not report that they

felt pressured by their coaches. It was surprising that respondents with injuries had higher mean values for all five types of motivation. Although not statistically meaningful comparisons (refer to table 4.4), Figure 4.9 does illustrate a difference in the mean values of all five types of motivation for athletes who were re-injured compared to athletes who were not re-injured. External regulation and introjected regulation are the types of motivation that are perceived as the types of motivation with external causes on the self-determination continuum and identified, integrated and intrinsic regulation are the types of motivation that are perceived to have more internal causes on the self-determination continuum (see figure 2.7). Although the difference in the scores obtained by athletes who were re-injured within three months after RTS compared to athletes who were not re-injured represented a trend for higher scores for the respondents with external causes for motivation, compared to athletes with the more internal causes for motivation (refer to 4.3.4) the difference had not statistical significance. Hayden and Lynch (2011) explained that even if physical signs of an injury can be successfully treated, psychological signs often remain. Athletes who are unable to manage these types of stressors can expect poor performance (Hayden and Lynch 2011). As explained above, the athletes in this study had to return to top-level competition and poor performance was not an option for these athletes

## 5.4 Limitations of this study

The quality, validity, strengths and limitations of the research design and techniques have mainly been discussed in chapter 3. Upon reflection on the execution of the study, some limitations of this study have been identified and critically evaluated.

Firstly, coaches' responses were insightful with regards to track and field, but the small sample size of coaches and demographic area was not representative. The coaches involved in this study were experienced and coached athletes on provincial and national level, but future studies may also investigate the views of less experienced coaches and coaches who coach

younger and non-elite athletes. Coaches' perspectives with regards to athletes' who decide to RTS themselves were not considered in this study (refer to appendix K – Question 10). It may be insightful to determine from coaches how often athletes decide to RTS without the proper clearance of the involved parties to RTS.

The athletes who were involved in the study represented a small population. None of the athletes scored high on external and introjected regulation and larger populations may include athletes who may score high on these types of motivation. It will be of value to compare these athletes' occurrence of re-injury to athletes with high scores on identified, integrated and intrinsic regulation. The athletes in this study did not show relatedness with previous similar injuries which may also be attributed to the small sample size.

The age groups, as explained in 2.2.2, could not all be included in the study. Youth and sub-youth athletes have their national championships before the end of March and do not have consecutive opportunities to participate at national competitions, compared to junior and senior athletes that have more than one opportunity to compete at national and international competitions. Secondly, the SMS-II still needs further research (refer to 2.7.2) and especially the appropriate language that should be used in the items of the SMS-II in order for younger athletes to fully comprehend the meaning of these items. Future studies should therefore include the youth and sub-youth age groups together with standardisation of the SMS-II in this population.

In 5.3.3 the possibility of how the time of season when athletes had to RTS during the execution of this study could influence the results, was explained. Only elite athletes that had to RTS during the national and international championships were involved in the study. Future studies can include elite athletes that RTS earlier during the season due to an injury during the previous season, off-season or preparation phase.

Some of the coaches who were considered for inclusion in the study were also not available for interviews until after completion of the athletics season.

It was, however, possible to interview coaches after completion of the track and field season in this study but it should be considered when planning future studies. Results for this study were consequently not influenced, but for future studies with populations that are small and where time for the execution of the study is limited, the availability of coaches may have a significant influence on the research study.

In 5.3.4 it was concluded that all the respondents of this study had similar types of motivation. This can be attributed to the fact that the respondents in this study were all members of the same athletics club in Bloemfontein. The emphasis at the club is to assist athletes to achieve individual top performances rather than winning team competitions (refer to comments at 5.2.2.4). Future studies can include athletes from various athletics clubs in order to include athletes who might experience more external pressure from their clubs to perform well in team competitions. It was mentioned in 4.3.3 that all the athletes were bursary holders at the UFS, but it will also be helpful to determine whether the athletes ever experienced a decrease in their bursary amount as a result of poor performance.

The type of injury was not controlled during this study, only the severity was. This was considered by the researcher, but due to the small population available to the researcher during the time of execution, different types of injuries were included in the analysis. The athletes from different specialist fields in track and field also experienced similar types of injuries (refer to 4.3.2). A percentage of 63% (n = 5) of the participants who returned to the sprint events had hamstring injuries. Future studies can control the results even more by focusing on a specialist field in track and field and considering similar types of injuries for these athletes.

Due to the researcher's personal involvement and interest in track and field as coach but also as physiotherapist, the respondents were all well-known to the researcher. This familiarity induced very relaxed interviews. Babbie (2007), however, cautions interviewers that they need to be neutral; their presence in the data collection process must have no effect on the responses

to questionnaire items. Although efforts were made to control the possibility of this bias, it cannot be excluded. Respondents were guaranteed confidentiality (refer to 3.5.2), but the possibility that some of these coaches' answers may have been influenced by the presence of the researcher cannot be ignored.

The next section concludes the critical discussion by referring to recommendations and implications for future research not yet mentioned.

## 5.5 Recommendations/Implications for future research

The study included only elite athletes from track and field. In 2.3.1 it was mentioned that physiotherapists in Bloemfontein most frequently have to make RTS decisions for track and field athletes and rugby players. As discussed in 5.4 above, the athletes in this study had similar types of motivation to RTS. Emphasis on the team effort and dependence on team members may, however, have different results. Future studies can therefor include sports from both individual and team sporting codes, for example track and field, swimming, judo, karate compared to netball, hockey, rugby, cricket and football.

Due to the alarming number of sequelae identified in studies mentioned in 2.4, future studies must pay attention to this phenomenon. Although respondents in this study did not show specific relatedness to previous similar injuries (refer to 5.3.3), future studies may exclude athletes with sequelae and focus on athletes that RTS after an injury sustained for the first time. This may, however, lead to a significant decrease in the size of the population.

Reaching athletes in person who are about to RTS is often difficult. Athletes who were about to RTS at international competitions, were included in this study but were often rushed to complete the testing instrument in time before departure. The use of electronic questionnaires and web-interfaces for research could be utilised in order to make it easier for researchers to reach these athletes in time for future studies.

Although the results regarding the type of motivation compared to the occurrence of re-injury of this study was not specific and conclusive; the trend of higher scores in external regulation and introjected regulation for athletes who were re-injured was noted (refer to 5.3.3). Further research on the specific scores of athletes' type of motivation and recurrence of injury is necessary and this research should include larger population sizes. Further research is also necessary in order to determine whether an athlete's high score for external regulation and introjected regulation can be related to re-injury. As explained in 5.4, none of the athletes scored high on these types of motivation and future studies must compare athletes who score high on external regulation and introjected regulation with the occurrence of re-injury. This may be uncovered if the population size is larger, if athletes of younger ages are included and athletes from different sporting codes are included (refer to 5.4). This may suggest that physiotherapists could use the adapted SMS-II to determine the scores of athletes' type of motivations to RTS. The specific scores for external regulation and introjected regulation that may predict possible re-injury need further investigation with studies that include larger population sizes. Coaches may be informed about the athletes' type of motivation and the necessary referrals to the appropriate professional or training partner(s) may be necessary (refer to 5.2.2.3) in order to assist with an improved RTS.

# *Chapter 6*
# CONCLUSION

The literature review in chapter 2 highlighted the relevancy of research on the different factors of the Decision-Based RTS model. Currently, the model and aspects of RTS is a relevant topic for research and it is clear from the numerous authors mentioned in chapter 2 as well as the respondents of the first part of this study, that research is needed on the type of motivation and its relatedness to the re-injury of athletes (refer to 5.2.2.4).

## 6.1 The coach, the athlete and the physiotherapist

The track and field coaches involved in this study expressed the need for the type of motivation of an athlete during RTS decisions to be considered. These coaches explained (refer to 5.2.2.2) that physiotherapists would be in a better position to evaluate the real reason why athletes would like to return to sport compared to themselves because coaches could be tricked easily by the athletes. The coaches of this study preferred to include themselves, sport doctors and physiotherapists in on-the-field decisions regarding continuation of participation and similarly preferred themselves, sport doctors and physiotherapists to make RTS decisions in their training groups. Coaches expect physiotherapists to consider the type of motivation of an athlete to RTS while dealing with RTS decisions. In order to maintain a good relationship between the coaches, the athlete and the physiotherapist, the type of motivation and re-injury need further research.

## 6.2 Type of motivation and re-injury of elite athletes

Seventy three percent of the participants were treated for similar injuries before (see 4.3.2). The athletes that were re-injured could not be categorised

to athletes participating in a specific event, nor did they represent athletes with a specific injury.

The respondents in this study tested high on integrated, identified and intrinsic regulation. All the respondents were representing similar types of motivation that leaned more towards the intrinsic type of motivation on the self-determination continuum illustrated in figure 2.7. A trend of a difference in the mean measured types of motivation of athletes who were re-injured after RTS, compared to those athletes who were not re-injured after RTS (refer to 5.3.3) was noticed, but these results were not statistically significant. Larger population sizes with different demographic compositions should be included in future studies in order to determine more exact clinical scores for the adapted SMS-II. This study therefore serves as basis for further research where the limitations and recommendations (refer to 5.4 and 5.5 above) should be considered.

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Appendix A
Application for approval as well as permission:  Head of sport - UFS

**Appendix A.pdf**

Appendix B
Application for approval as well as permission:  General manager - AFS

**Appendix B.pdf**

Appendix C
Application for approval as well as permission: Director Student Life – UFS and Vice Rector Research – UFS

**Appendix C.pdf**

Appendix D
Application for approval as well as permission: Report Evaluation Committee – research (School for allied health professions)

**Appendix D.pdf**

Appendix E
Application for approval as well as permission: Health Sciences research Ethics Committee.

**Appendix E.pdf**

Appendix F
Approval – Mr FC van Rooyen (Department of Biostatistics)

**Appendix F.pdf**

Appendix G
Informed consent letter to participant athletes

**Appendix G.pdf**

Appendix H
Adapted revised Sport Motivation Scale (SMS-II)

**Appendix H A.pdf**

**Appendix H E.pdf**

Appendix I
Data sheet and information form physiotherapist

**Appendix I A 1.pdf**

**Appendix I A 2.pdf**

**Appendix I E 1.pdf**

**Appendix I E 2.pdf**

Appendix J
Informed consent letter to participant coaches

**Appendix J.pdf**

Appendix K
Structured interview – coaches

**Appendix K - Afrikaans.pdf**
**Appendix K - English.pdf**

Dear Mr Prinsloo

This study aims to launch an in-depth investigation into the relations between athlete motivation for returning to sport after injury, and the recurrence of injury. The research will be conducted by means of an interview to determine what coaches expect from physiotherapists regarding decisions on return to sport after injury.

Hereby I request approval for the pilot study of the study: “Return to Sport after Injury: Investigation of Motivation and Recurrence of injury” to be performed on coaches from the Kovsie athletics club. Individual interviews will be organised with the coaches in order to determine what coaches expect from physiotherapists regarding decisions about return to sport after injury. If little or no changes to the questions in the interview need to be done following the pilot study, the results will be included in the main study.

Attached to this letter of approval is the complete protocol for the study, which will be handed in to the ethics committee in February 2016. When the study is approved by the ethics committee, a copy of the letter of approval will be sent to you.

I request approval regarding the following:

Permission to organise interviews with coaches during February 2016. Respondents will be contacted by me personally and respondents will be asked to comment about the questions in the interview.

Participants will be completely aware about what will be expected from them and will receive letters of consent to sign.

If you have any further questions about the research you are welcome to contact me telephonically at 083 228 1153.

I will appreciate it if you can provide me with written approval of the study for documentation purposes.

Thank you in advance

Johan Human

KovsieSport

UFS UV

01 March 2016

TO WHOM IT MAY CONCERN

**JOHAN HUMAN: STUDY RETURN TO SPORT AFTER INJURY**

Kovsiesport hereby approve and support Mr. Human in his study as mentioned above.

Permission is granted for the following:

- To hand out questionnaires to all registered athletes of AFS
- With the permission of coaches and parents contact athletes necessary for his study
- To interview coaches as deemed necessary

Regards

DB Prinsloo

Director: Kovsiesport

051 4012859 / 0832878810 / 6109

Dear Mr Gerrit Coetzer

This study aims to launch an in-depth investigation into the relations between athlete motivation for returning to sport after injury, and the recurrence of injury. The research will firstly be conducted on athletes returning to sport after injury by means of a questionnaire (the Adapted Sport Motivation Scale) to determine what the motivation of the athlete is to return to sport and will then be contacted first on a weekly basis and after one month on a monthly basis telephonically to determine if re-injury occurred. The research will secondly be conducted by means of an interview with coaches registered at AFS to determine what coaches expect from physiotherapists regarding decisions on return to sport after injury.

Hereby I request approval for the study: "Return to Sport after Injury: The relationship between an athlete's type of motivation and a recurrence of injury" to be performed on provincial and national athletes registered with FSA from 20 March 2016 to 30 May 2016 and on coaches from Bloemfontein registered with FSA during April and May 2016. Questionnaires will be completed anonymously by athletes in order to determine the motivation of the athlete and the athletes will be contacted telephonically using details recorded on a data sheet. The contact details for each participant will only appear on the contact data sheet used only by the researcher and only a unique identification number will appear on the data list and questionnaire of each respondent.

Secondly coaches will be asked about their expectations from physiotherapists regarding decisions on return to sport after injury in individual interviews with the researcher.

Attached to this letter of approval is the complete protocol for the study, as handed in to the ethics committee in February 2016. When the study is approved by the ethics committee, a copy of the letter of approval will be sent to you.

I request approval regarding the following:

- Permission to hand questionnaires to all provincial and national athletes registered with FSA who return to sport participation after injury.
- Permission to contact them one week, two weeks, three weeks, four weeks and on a monthly basis after return to sport until the end of their respective seasons to determine if re-injury occurred.
- Permission to organise interviews with coaches during March and April 2016. Respondents will be contacted by me personally to organise a suitable time and venue for the interview.

Participants will be completely aware about what will be expected from them and will receive letters of consent to sign.

If you have any further questions about the research you are welcome to contact me telephonically at 083 228 1153.

I will appreciate it if you can provide me with written approval of the study for documentation purposes.

Thank you in advance

Johan Human

P.O. Box 12172
Brandwag
9324

www.athleticsfs.co.za

Tel: 051-0110536
051-4303251

Fax: 051-4303264
086-2282062
E-mail: admin@athleticsfs.co.za

06 January 2015

TO whom it may concern.

**JOHAN HUMAN: STUDY RETURN TO SPORT AFTER INJUREY**

Dear Sir / Me.

Athletics Free State (AFS) approve and support Johan in his above study.

Permission is granted for the following:

To hand out questionnaires to all registered athletes of AFS.

With the permission of coaches and parents contact athletes to obtain results as deemed necessary for his study.

To interview coaches as deemed necessary.

We wish him all the best with his study.

Gerrit COETZER
GENERAL MANAGER

Department Physiotherapy

University of the Free State

March 2016

University of the Free State

Dear Mrs C Faasen

This study aims to launch an in-depth investigation into the relations between athlete motivation for returning to sport after injury, and the recurrence of injury. The research will be conducted by means of an interview to determine what coaches expect from physiotherapists regarding decisions on return to sport after injury.

Hereby I request approval for the pilot study of the study: : “Return to Sport after Injury: The relationship between an athlete’s type of motivation and a recurrence of injury” to be performed on coaches from the Kovsie athletics club. Individual interviews will be organised with the coaches in order to determine what coaches expect of physiotherapists regarding decisions about return to sport after injury. If little or no changes to the questions in the interview need to be done following the pilot study, the results will be included in the main study.

Attached to this letter of approval is the complete protocol for the study, which will be handed in to the ethics committee in February 2016. When the study is approved by the ethics committee, a copy of the letter of approval will be sent to you.

I request approval regarding the following:

Permission to organise interviews with coaches during the last week of March 2016. Respondents will be contacted by me personally and respondents will be asked to comment about the questions in the interview.

Participants will be completely aware about what will be expected from them and will receive letters of consent to sign.

If you have any further questions about the research you are welcome to contact me telephonically at 083 228 1153.

I will appreciate it if you can provide me with written approval of the study for documentation purposes.

Thank you in advance

Johan Human

Department Physiotherapy

University of the Free State

March 2016

University of the Free State

Dear Prof RC Witthuhn

This study aims to launch an in-depth investigation into the relations between athlete motivation for returning to sport after injury, and the recurrence of injury. The research will be conducted by means of an interview to determine what coaches expect from physiotherapists regarding decisions on return to sport after injury.

Hereby I request approval for the pilot study of the study: : “Return to Sport after Injury: The relationship between an athlete’s type of motivation and a recurrence of injury” to be performed on coaches from the Kovsie athletics club. Individual interviews will be organised with the coaches in order to determine what coaches expect of physiotherapists regarding decisions about return to sport after injury. If little or no changes to the questions in the interview need to be done following the pilot study, the results will be included in the main study.

Attached to this letter of approval is the complete protocol for the study, which will be handed in to the ethics committee in February 2016. When the study is approved by the ethics committee, a copy of the letter of approval will be sent to you.

I request approval regarding the following:

Permission to organise interviews with coaches during the last week of March 2016. Respondents will be contacted by me personally and respondents will be asked to comment about the questions in the interview.

Participants will be completely aware about what will be expected from them and will receive letters of consent to sign.

If you have any further questions about the research you are welcome to contact me telephonically at 083 228 1153.

I will appreciate it if you can provide me with written approval of the study for documentation purposes.

Thank you in advance

Johan Human

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA

UFS·UV
HEALTH SCIENCES

## HEALTH SCIENCES RESEARCH ETHICS COMMITTEE

## APPROVAL FROM UFS AUTHORITIES
## FOR PARTICIPATION OF STUDENTS/STAFF IN RESEARCH PROJECTS

| | | | |
|---|---|---|---|
| **Title, Initials, Surname:** | MR PJ. HUMAN | **Staff/Student number** | |
| **Department/Institution:** | PHYSIOTHERAPY | | |
| **Phone:** | 083 228 1153 | **E-mail address:** | jhuman@gc.co.za |
| **Supervisor(s):** | C Brandt | **Phone:** | 083 264 0189 |

| | |
|---|---|
| **Protocol Title:** | RETURN TO SPORT AFTER INJURY: THE RELATIONSHIP BETWEEN AN ATHLETE'S TYPE OF MOTIVATION AND A RECURRENCE OF INJURY |

| | | |
|---|---|---|
| **Who will be involved in the study? (tick ✓)** | ☑ UFS Personnel | ☑ Students |

**INSTRUCTIONS:**

I. Please attach the following to this form when requesting approval from the signatories:
   a. The study protocol; and
   b. The Health Sciences Research Ethics Committee (HSREC) application form.

II. Kindly note that it is the responsibility of the researcher(s) to ensure that all relevant signatures are obtained before this signed form is returned to HSREC Administration (D104) Francois Retief Building, Faculty of Health Sciences, UFS. The protocol may, however, be submitted for HSREC approval while signatures are being obtained.

III. Please choose either section A **OR** B below.

IV. Section C is **mandatory** for all research on campus.

| A. FOR RESEARCH ON UFS STUDENTS AND/OR STAFF FROM A SPECIFIC FACULTY, BOTH THE FOLLOWING SIGNATURES MUST BE OBTAINED: | | |
|---|---|---|
| I. HEAD OF SCHOOL (IF APPLICABLE): | ☐ Approved | ☐ Not Approved |
| Signature: | Date: | |
| | | |
| Comments: | | |
| | | |

| II. DEAN OF FACULTY: | ☐ Approved | ☐ Not Approved |
|---|---|---|
| Signature: | Date: | |
| | | |
| Comments: | | |
| | | |

OR

| B. FOR RESEARCH ON INTERFACULTY UFS STUDENTS AND/OR STAFF AND/OR STUDENTS IN UFS RESIDENCES, THE FOLLOWING SIGNATURE MUST BE OBTAINED: | | |
|---|---|---|
| I. DEAN: STUDENT AFFAIRS | ☐ Approved | ☐ Not Approved |
| Signature: | Date: | |
| C. Fadiran | 2016-03-15 | |
| Comments: | | |
| | | |

AND

| C. ALL RESEARCH ON STUDENTS AND/OR STAFF TO BE APPROVED BY: | | |
|---|---|---|
| I. VICE-RECTOR: RESEARCH | ☐ Approved | ☐ Not Approved |
| Signature: | Date: | |
| | 29/03/2016 | |
| Comments: | | |
| | | |

Die Universiteit van ... / The University of ...
2016 -03- ...
Prof. R.C. Wit... / VISEREKTOR: NAVO... / VICE RECTOR: RES...
Prof. Corli Witthuhn
Viserektor:Navorsing - Vice Rector:Research
Universiteit van die Vrystaat
University of the Free State
Hoofgebou K61 Tel 051 - 401 2116



*FORM: Approval from UFS Authorities V01*
*Effective date: TBD*
*Faculty of Health Sciences, University of the Free State*

BYLAE 7

**SCHOOL FOR ALLIED HEALTH PROFESSIONS**
**SKOOL VIR AANVULLENDE GESONDHEIDSBEROEPE**

**VERSLAG EVALUASIEKOMITEE**
**REPORT EVALUATION COMMITTEE - RESEARCH**

***NB. Evaluation committees should be appointed & approved by the Research Committee of the SAHP* six(6) *weeks before the set date. All members should receive the protocol at least ten (10) working days before the set date.***

**DISSERTATION/VERHANDELING: Ph.D. .....** **Master/Magister: Full ✓..... mini.....**

**CANDIDATE/KANDIDAAT:** Johan Human

**DATUM/DATE:** 12/02/2015

**TITLE/TITEL:** Return to Sport after Injury: Investigation of Motivation and Recurrence of Injury

**MEMBERS OF THE COMMITTEE/**
**LEDE VAN DIE KOMITEE**

**Chairman/Voorsitter:** Prof D Coetzee

**Lid van die Dagbestuur:**
**Member of Executive Committee:** Prof D Coetzee

**Expert/Kundige:** Cealia Katzke

**Expert/Kundige:** Melissa

**Expert/Kundige:** Dr Melene Oppermann

**Biostatistician/Biostatistiek:** Corad van Rooyen

**Studyleader/promotor/Studieleier/**
**promotor:** Carlia Brandt

**Co Study Leader/promotor**
**Mede-Studieleier/mede promotor:** ? —

—

**PROCEDURE/PROSEDURE**

1. **Word of Welcome/Verwelkoming**
   Al members and the candidate are welcomed by the chairperson.
2. **Agreement on handling of session and process in SAHP**
   **Ooreenkoms oor die hantering van die sessie en proses in SAGB**
   - The chairperson explains the procedure of discussing the protocol page/section by section.
   - Editorial corrections as indicated by the members of the committee will be given to the supervisor to be corrected under their supervision.
   - The title will be discussed at the end of the session.(***No title registration and appointment of examiners may take place before ethical approval has been granted).***

- Any member of the evaluation committee may request to review the protocol again after the recommended corrections have been done. After the re assessment of the corrected version of the protocol these members have to inform the chairperson in writing( by email) of their approval of the revised protocol.
- **Only** after all the approvals have been recieved by the chairperson the report will be signed off by the chairperson and **only then** the protocol can be submitted to the Ethics committee of the Faculty. The chairperson will inform the Ethics committee and studyleader of the final approval.
- The student will be excused after the discussion of the protocol.
- Members will be requested to hand in their copy of the protocol to the studyleader.
- All title registrations must be submitted to the office of the SAHP **electronically** on the correct form, for approval at the relevant committees

---

**3.1 Candidate has been informed of the procedure/ Kandidaat is ingelig oor die prosedure (✓/×)** ✓

**4. Presentation – if applicable/**

**Voordrag – indien toepaslik** Gelewer

**5. Summary of the most important recommendations on the protocol:/ Opsomming van die belangrikste aanbevelings ten opsigte van die protokol**

**5.1 Titlel page, Concept clarification & abbreviations //Titel bladsy, konsepklarifikasie & afkortings**

Titel: The relationship between athletes type of motivation and a recurrence of injury

Konsepklarifikasie: Moet uitgebrei word

**5.2 Introduction and Literature review/Inleiding en literatuur oorsig**

Contains a clear statement demonstrating the focus of the study/'n Duidelike stelling wat die fokus van die studie uitlig (✓)__ revision ✓

Inleiding moet as fokus van die studie meer in samewerking met 'n sportsielkundige beleid formuleer word.

Belyn doelstellinge tov die model

Literature is clearly related to the problem statement/Literatuur ondersteun die probleemstelling ten volle (✓)__ revision ✓

Literatuur moet uitgebrei word — meer toepassings van die sielkundige aspekte van beserings

**5.3 References/Verwysings(applicable for topic and recent/toepaslik vir onderwerp en resent) (✓)** ✓ **revision**___

Comments/kommentaar:

**5.4 Problem Statement/Probleemstelling**

A clear statement demonstrating that it is worthy of study/'n duidelike stelling wat demonstreer dat die onderwerp die moeite werd is om na te vors (✓)___ revision ✓

Comments/kommentaar: Probleemstelling moet belyn wes wat die model.

**5.5 Aim/Doel**

Desribed in a logical, explicit manner/beskryf in 'n logiese, ekplisiete wyse (✓)__ revision ✓

Konsulteer met Sportsielkundige

Objectives/doelwitte(✓)__ revision ✓

Stel doelwitte, ten aanbevelings gemaak deur die panel. Sien navolgende!

**5.6 Methodology/Metode:**

Design/ontwerp

Appropriate for the question//toepaslik vir die navorsingsvraag (✓/×) ✓

Ontwerp: Cross sectional Cohort – Konsulteer met die Statistikus

Study population/studiepopulasie:

Desribed in detail//beskryf (✓) ✓ revision___

Ten. orde – Gebruik die totale populasie van atlete

Inclusion criteria/insluitings criteria (✓) ✓ revision___

Exclusion criteria/uitsluitings criteria. (✓) ✓ revision___

Measurement/meting:

In allignment with the research question and the literature/belyn met navorsingsvraad en literatuur (✓)__ revision ✓

Belyn die navorsingsvraag en die literatuur – Belangrik om ook die sielkundige aspekte daarin te spreek.

Explanation of data gathering and analysis/inligting oor data insameling en analise(✓) ✓ revision ✓

Vraelyste moet in samewerking met sielkundiges en statistikus finaliseer word.

Belyn wat met doel!

Measurement errors/Metingsfoute:

5.7 **Pilotstudy/Loodstudie**
Paticipants/deelnemers (✓)✓ revision___

aim/doel (✓)__ revision___

5.8 **Data analysis/Data verwerking** (✓)__ revision___

6. **Ethics/Etiek** (✓)✓ revision___

7. **Time Schedule/Tydskedule**
Realistic for execution/realisties vir uitvoering(✓)✓ revision___

Comments/kommentaar:

8. **Budget/Begroting**
Funds available/fondse beskikbaar (✓)✓ revision___

Comments/kommentaar:

9. **Appendixes/Bylaes**
**Letters of permission**(✓)___ revision✓

Comments/kommentaar: Kontroleer name oor wie dit geteken word

**Informed concent/ingeligte toestemming**(✓)✓ revision___

Comments/kommentaar:

Measuring instruments/meetinstrumente (✓)___ revision✓

Hersien vraelyste in samewerking met statistikus Jen en Sportsie/Kinetici

**10. Language & technical editing/Taal & Tegniese versorging (✓)** ✓ revision___

Comments//kommentaar: Tegniese versorging is goed.

**12. Discussion of the protocol with reference to:/**
**Bespreking van die protokol deur die komitee, ten opsigte van:**

- **Feasibility of the study?/Uitvoerbaarheid van die studie?(✓/×)** ☑
- **Adhere the study to the level discriptors (NQF) (✓/×)**
  **of a Masters/Doctoral degree?**
  **Voldoen die studie aan die vlakvereistes (NKF)**
  **van die Magister of Ph.D van die graad?** ☑
- **Sal die kandidat opgewasse wees om die studie te voltooi?/**
  **Will the candidate be able to complete the study? (✓/×)** ☑

**If not - reasons?/Indien nie - redes?**

- **Is the title correct?/Is die titel korrek? (✓/×)** ☒
- **If no – recommend new title/ Indien nie – voorgestelde tiel**

kontroleer vir taalkundige.
The relationship between athletes type of motivation and a presence of injury.

**13. RECOMMENDATIONS/AANBEVELINGS**

To be re-assessed/her assesseer: (✓/×) ✓
By whom/deur wie:

Approved with corrections to be done onder supervision of the study leader/promotor/goedgekeur met korreksies gedoen onder leiding van die studieleier/promotor(✓/×) ✓

**14. FINAL SIGN OF AFTER RE ASSESSMENT AND APPROVAL TO SUBMIT TO ETHICS COMMITTEE/ FINALE AFTEKENING NA HER ASSESSERING EN TOESTEMMING VIR VOORLEGGING AAN ETIEK KOMITEE**

.....
**HAIRPERSON COMMITTEE/**
**OORSITTER KOMITEE**

13/02/2015
**DATE/DATUM**

EC26

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA

UFS·UV
HEALTH SCIENCES
GESONDHEIDSWETENSKAPPE

# APPLICATION FOR ETHICAL APPROVAL TO CONDUCT RESEARCH

**ALL SECTIONS MUST BE COMPLETED, EXCEPT SECTION E TO BE COMPLETED ONLY IF THE STUDY INVOLVES AN INTERVENTION**

## SECTION A - PROPOSAL IDENTIFICATION DETAILS

**1. TITLE OF THE PROPOSAL (And number if applicable)**

**Return to Sport after Injury: The relationship between an athlete's type of motivation and a recurrence of injury**

**2. HAS THIS PROTOCOL BEEN SUBMITTED TO ANY OTHER ETHICAL REVIEW COMMITTEE?**

| Yes | ~~No~~ X |
|---|---|

2.1 If YES, list which institutions and any reference numbers.

_____

_____

_____

2.2 What was/were the outcome/s of these applications?

_____

_____

_____

**3.** A SUMMARY OF THE RESEARCH PROTOCOL IN LAY TERMS as an addendum to the protocol on a separate page (**single spacing not longer than 1 A4 page**) in Word format and forwarded by e-mail as an attachment to **EthicsFHS@ufs.ac.za**

***Kindly note that this summary has to be a short version of the Information Leaflet to the participant. It should include the following information:***

- ***Where the study will be conducted***
- ***What population will be included in the study***
- ***What method will be used***
- ***What treatment will be administered to participants***
- ***What control method will be used***
- ***Risk and adverse effects of participating in the study***
- ***Expected outcome of the research.***

Decisions regarding return-to-sport after an injury are often taken by physiotherapists. These decisions are often made without using objective measuring tools like tests and screenings. Objective measuring tools, to assist the physiotherapist in return-to-sport decisions, are lacking. Due to this lack of measuring tools, researchers are currently working on a model to assist medical persons who have to make decisions regarding return-to-sport. One of the aspects identified for further research in this model is consideration of the type of motivation of an athlete to return-to-sport. My aim is therefor to determine if athletes that has intrinsic motivation for return-to-sport after an injury have the same recurrence of injury compared to athletes who have extrinsic motivation for return-to-sport. An example of someone who has intrinsic motivation is someone who wants to return to sport because he/she is interested in learning how to improve him/herself. An example of someone who has extrinsic motivation is someone who return-to-sport because he/she might feel that the coach would disapprove of him/her if he/she did not return-to-sport. Structured interviews will be used to determine if athletic coaches in Bloemfontein consider or would like to consider type of motivation when managing an athlete's return-to-sport. An adapted revised Sport Motivation Scale will be used to determine the type of motivation of elite athletes from Bloemfontein when they are about to return-to-sport and follow-up phone calls will be used to determine if these athletes experience any recurrence of injuries during the same competition season. No treatment will be administered to any of the participants. There will be no risk for any of the participants of the study.

If the type of motivation can predict recurrence of injury of an athlete, physiotherapists or medical practitioners can use the adapted revised Sport Motivation Scale to advise multidisciplinary intervention by a psychologist before an athlete is cleared for return-to-sport. The results of this study will be beneficial to the development of the objective model for return-to-sport and will benefit athletes through more objective teamwork by health professionals.

## 4. INVESTIGATOR DETAILS

### 4.1 Principal Investigator:

Title: Mr

Initials and Last Name: P.J. Human

Department and/or Institution: Department of Physiotherapy

Phone: 083 228 1153

Email: jhuman@gc.co.za

Fax: (051) 444 5012

Professional Council: HPCSA Registration Number: PT 0105660

Signature: _____

Date: 22/02/2016

### 4.1.1 (If different to 4.1 above) UFS Principal Investigator

Title: _____

Initials and Last Name: _____

Department and/or Institution: _____

_____

Contact number: _____

Email: _____

Fax: _____

Professional Council:_____ Registration Number:_____

Signature: _____

Date: ____/____/_____

### 4.2 Co-investigators and/or Statistician

**Kindly ensure that all investigators and/or statisticians involved in this study have approved the research protocol and signed the section below.**

| Name | Department and/or Institution | Professional Council Number | Telephone | Signature |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## 5. STUDY FOR A QUALIFICATION

| | | | |
|---|---|---|---|
| 5.1 | Is the study being undertaken for a higher degree? | ~~Yes~~ | No |

If YES,

5.1.1 Specify degree? Masters in Physiotherapy

5.1.2 Specify faculty and department: Health Faculty, Physiotherapy dept.

5.1.3 Student name (If not the same as 4.1): _____

5.1.4 Supervisor name: C. Brandt.

5.1.5 Supervisor details

Contact number: _____

Email: _____

Signature: _____

Date: ___/___/_____

5.1.6 Signature: Head of the Dept of the researcher _____

## SECTION B – CHECKLIST

| | | Tick the appropriate block | | |
|---|---|---|---|---|
| 1. | Application form | ~~Yes~~ | No | |
| 2. | Covering letter | ~~Yes~~ | No | |
| 3. | Detailed protocol | ~~Yes~~ | No | |
| 4. | Proposed study budget | ~~Yes~~ | No | |
| 5. | Investigator's brochure and other related material | Yes | No | ~~NA~~ |
| 6. | Protocol summary | ~~Yes~~ | No | |
| 7. | Approval from the Head of Department/School | ~~Yes~~ | No | NA |
| 8. | Approval from School Research Committee/Evaluation committee, if applicable | ~~Yes~~ | No | NA |
| 9. | Approval from institution where study will be conducted, if applicable In progress. | Yes | No | NA |
| 10. | Approval from Radiation Committee, if applicable | Yes | No | ~~NA~~ |
| 11. | Approval from Animal Research Committee if applicable | Yes | No | ~~NA~~ |
| 12. | Consent form | ~~Yes~~ | No | NA |
| 13 | Informed consent in language of choice? | ~~Yes~~ | No | NA |

14. What is the age range of participants in the study?

18 years and older.

14.1 If participants are minors (under 18 years), from whom will consent be obtained?

Parents and/or guardians

| 14.2 If participants are minors, is an Assent Document provided? | Yes | No | NA |
|---|---|---|---|
| | | | X |

15. If records only will be included, from whom will consent be obtained?

/

| | | | |
|---|---|---|---|
| 16. Patient/Subject information sheet | X | No | NA |
| 17. Measuring instrument/Data form | X | No | NA |
| 18. Will the research benefit the participant in any direct way? | Yes | X | |

If YES, describe the benefits to the study participant

**Procedures (Mark research procedure(s) that will be used)**

| | | |
|---|---|---|
| 19. | Record review/checklist (must be attached) | X |
| 20. | Structured interview/questionnaire (must be attached)/checklist (must be attached) | X |
| 21. | Self-administered questionnaire (must be attached) | |
| 22. | Examination (state below at explanation: nature and frequency of examination) | |
| 23. | Drug or other substance administration (state below at explanation: name, dose, and frequency of administration) | |
| 24. | X-rays | |
| 25. | Isotope administration (state below at explanation: name, dose, and frequency) | |
| 26. | Blood sampling; □Venous; □Arterial (state below at explanation: Volume to be taken and the frequency of sampling) | |
| 27. | Biopsy | |

28. Focus groups/In depth interviews/nominal group technique ☐
29. Radiotherapy ☐

Other procedures (explain below at explanation)

**Explanation**

30. Is/are procedure(s) routine for: (Tick all that apply)

(a) Diagnosis / management? ☐
(b) Specific to this research? ☐

30.1 Who will carry out the procedure(s)? (Give names, qualifications, expertise with procedures)

J. Human. (B.Sc. Physiotherapy).
Previous experience in structured interviews and questionnaires in honours degree.

30.2 Who will fund/pay for the procedures? (Tick all that apply)

(a) Patient/Medical fund ☐ (b) Researcher ☒
(c) Sponsor ☐ (d) Other ☐

If other, specify _____

31. Risks of the study procedure(s): (Tick all that apply)

| | | | |
|---|---|---|---|
| ☒ | No risk | ☐ | Physical discomfort |
| ☐ | Pain | ☐ | Possible complications |
| ☐ | Side effects from agents used | ☐ | Breach of confidentiality |
| ☐ | Possible stigmatisation | ☐ | Psychological stress |

31.1 If you have checked any of the above except "No risk" please provide details

| | | |
|---|---|---|
| 32. | Will genetic material be collected and stored as part of the protocol? | Yes / No (X) |
| 32.1 | If YES, Separate Informed Consent included? | Yes / No (X) |

| | | |
|---|---|---|
| 33. | Will blood or tissues be stored for future use or future testing as part of this study? | Yes / No (X) |
| 33.1 | If YES, Separate Informed Consent included? | Yes / No |

33.1.1 Provide location of storage facility

33.1.2 Name type of specimen to be retained:

33.1.3 Where will investigations be performed?

**SECTION C - INFORMATION FOR ALL STUDIES**

1. Study design: Cohort-analytical study.
2. Estimated number of participants: 70
3. Study period (Anticipated start and end date): March - May 2016.
4. Where will the research be carried out: Bloemfontein.
5. Is there an agreement amongst researchers regarding authorship when articles are to be published? Yes

## SECTION D - FINANCIAL AND CONTRACTUAL INFORMATION

1. Indicate who is carrying the cost of this research (Tick those that are applicable)

- [X] Researcher self
- [ ] Department
- [ ] School
- [ ] Pharmaceutical company (specify)_____
- [ ] Research Institution e.g. NRF, MRC
- [ ] Bursary
- [ ] Other sponsor, specify _____

1.1 Is the study sponsored/funded by a Pharmaceutical Company? For invoicing purposes you are required to provide company name, address, contact person and telephone number in the space provided below.

| Yes | No |
|---|---|
| | X |

1.2 Who is the sponsor/funder of the study?

✓

1.3 What is the total budget/sponsorship for the study?

R7050-00

1.3(a) Is the overall budget inclusive of Ethics Review levy? (budget/sponsorship must be inclusive of this levy)

| Yes | No |
|---|---|
| | |

N.A.

1.4 Into what fund is the sponsorship being paid?

✓

1.5 Are there any restrictions or conditions attached to publication and/or presentation of the study results? (Note that any such restrictions or conditions contained in funding contracts must be made available to the Committee along with the proposal)

| Yes | No |
|---|---|
| | X |

1.6 Does the contract specifically recognize the independence of the researchers involved?

| Yes | No |
|---|---|
| ✓ | |

N.A.

2. Will additional costs be incurred by the institution where research is being conducted?

| Yes | No |
|---|---|
| | X |

If YES, specify these costs

_____

_____

_____

_____

_____

3. Will participants receive any remuneration?

| Yes | No |
|---|---|
| | X |

If YES, specify amount: _____

Explain what the remuneration is for

_____

_____

_____

_____

_____

**SECTION E - INTERVENTION INFORMATION**

1. Intervention period (Anticipated start and end date): _____

1.1 Describe the nature of intervals for the intervention period in regards to minutes, hours, days, weeks, months, years.

_____

_____

_____

_____

_____

2. Is the product registered with the Medicines Control Council?

| NA | Yes | No |
|---|---|---|
| X | | |

2.1 If YES, provide registration number:_____

2.2 If NO, is the letter to the MCC attached?

| Yes | No |
|---|---|
| | |

3. If a device, product code number:_____

FDA registration number:_____

EU mark reference number:_____

4. Is this study registered with the NHREC? | Yes | No |

4.1 Give registration number:_____

5. Are results of similar trials available? | Yes | No |

6. Is the investigator(s) covered by professional liability insurance? | Yes | No |

6.1 If YES, provide policy number:_____

7. Does the trial involve hospitalisation of patients? | Yes | No |

7.1 If YES, which hospital(s): _____

_____

Who is responsible for the hospitalisation costs?_____

Specify the duration of hospitalisation:_____

Specify how often the participants need to be hospitalised:_____

8. Is this a multicentre study? | Yes | No |

8.1 If YES, list the other Centres involved in this study

_____

_____

_____

_____

9. If this is a multicentre study, the UFS counterpart/PI undertakes that he or she is fully conversant with the content of the protocol, understands fully the ethical implications of the protocol, and takes full responsibility for the implementation of the protocol meeting ethical standards.

**Signature:** _____ **Date:**___/___/_____

10. Justification for the trial: Has a literature search been done and included?

| Yes | No |
|---|---|
| | |

If NO, please submit a systematic literature review or meta-analysis as justification of the trial together with statistical evaluations

11. Study phase:

| | | | |
|---|---|---|---|
| ☐ | Phase 1 | ☐ | Phase 1 and 2 |
| ☐ | Phase 2 | ☐ | Phase 2 and 3 |
| ☐ | Phase 3 | ☐ | Phase 4 |
| ☐ | Other | | |

12. Intervention type

| | | | |
|---|---|---|---|
| ☐ | Unregistered drug | ☐ | Registered drug, new application |
| ☐ | Registered drug | ☐ | Gene transfer |
| ☐ | Device | ☐ | Stem cell |
| ☐ | Vaccine | ☐ | Procedural |
| ☐ | Behavioural | ☐ | Care change |
| ☐ | Stem cell | ☐ | Training |
| ☐ | Treatment | ☐ | Other: specify_____ |

13. Purpose:

| | | | |
|---|---|---|---|
| ☐ | Treatment | ☐ | Prevention v Diagnostic |
| ☐ | Non-therapeutic (e.g. phase 1) | ☐ | Education/counselling/training |
| ☐ | Other, specify_____ | | |

14. Allocation:

| | Randomised | | Non-Randomised |
|---|---|---|---|

15. Masking:

| | | | |
|---|---|---|---|
| | Open | | Single-blind |
| | Double-blind | | |

16. Describe the control group:

17. Is the justification for the control group attached?

| Yes | No |
|---|---|

18. Assignment:

| | | | |
|---|---|---|---|
| | Single group | | Cross-over |
| | Parallel | | Factorial |
| | Expanded access | | |

19. Endpoints:

| | | | |
|---|---|---|---|
| | Safety | | Safety/Efficacy |
| | Efficacy | | Bioequivalence |
| | Pharmacokinetic | | Pharmacokinetic/dynamics |
| | Pharmacodynamics | | Other |

If Other, please specify

20. Drug/product name (Generic):

_____

20.1 Manufacturer Name:

_____

20.2 Country of manufacture: _____

21. Washout period, if applicable: _____

| | Yes | No |
|---|---|---|
| 22. Have arrangements been made to provide post trial access to product as specified in the Declaration of Helsinki, 2000? | | |

For YES, please provide details in a separate document.
For NO please provide justification in a separate document.

23. Good Clinical Practice (GCP) (Note: investigator's meetings do not qualify as GCP training)

Give the date and name of GCP course attended for all investigators:

| Name of Investigator | GCP course attended | Date |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**SECTION F - STATEMENT ON CONFLICT OF INTEREST**

The researcher is expected to declare to the Committee the presence of any potential or existing conflict of interest that may potentially pose a threat to the scientific integrity and ethical conduct of any research in the Faculty. The Committee will decide whether such conflicts are sufficient as to warrant consideration of their impact on the ethical conduct of the study.

Disclosure of conflict of interest does not imply that a study will be deemed unethical, as the mere existence of a conflict of interest does not mean that a study cannot be conducted ethically. However, failure to declare to the Committee a conflict of

interest known to the researcher at the outset of the study will be deemed to be unethical conduct.

Researchers are therefore expected to sign **either** one of the two declarations below.

a) As the Principal Researcher in this study (name: P.J. Human), I hereby declare that I am **not aware** of any potential conflict of interest which may influence my ethical conduct of this study.

**Signature:** _____ **Date:** 26/02/2016.

b) As the Principal Researcher in this study (name: _____), I hereby declare that I am **aware** of potential conflicts of interest which should be considered by the Committee:

**Signature:** _____ **Date:** ___/___/_____

Declare the conflicts of interests:

_____

_____

_____

_____

_____

_____

## SECTION G: ETHICAL AND LEGAL ASPECTS

1. Detail of the insurance to be provided

See protocol.

2. Specify the possible ethical issues relevant to the study.

19 February 2016

For attention: Ethics Committee
Faculty of Health Sciences

**Title of project: Return to Sport after Injury: The relationship between an athlete's type of motivation and a recurrence of injury .**

**Researcher:**

J Human

I hereby confirm that I approve of the study design, sampling method, measurement, and statistical analysis of the above-mentioned protocol.

Yours faithfully

F C van Rooyen

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Department of Biostatistics
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205 Nelson Mandela Drive/Rylaan, Park West/Parkwes, Bloemfontein 9301, South Africa/Suid-Afrika
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# Return to Sport after Injury: The relationship between an athlete's type of motivation and a recurrence of injury

**Informed consent**

Dear Participant

We, Johan Human (researcher) and Corlia Brandt (study leader) are doing research on the motivation of athletes when returning to sport and the recurrence of injury. In this part of the study we would like to determine if there are any correlation between the type of motivation for return to sport after an injury and re-injury.

We invite provincial and national athletes who are returning to sport participation after injury to participate in this research study.

The participant will be asked to complete the questions in the Adapted Sport Motivation Scale to determine his/her motivation for returning to sport participation. Completion of the list should take about 30 minutes. The athletes' contact details will only be recorded on a contact data list with a unique data number for each participant. The participant will be contacted by the researcher to determine if re-injury occurred after one week, two weeks, three weeks, four weeks and on a monthly basis until the end of the season, after return to sport. The name of the participant will not appear on the completed data sheet or the Adapted Sport Motivation Scale, but only on the contact data list. The participant may withdraw from the study at any time. The results of the study may be published or presented. There are no costs or payments involved for the participants. There are no risks to the coach participating in this study.

Feel free to contact the researcher with any further questions regarding the study: Johan Human 083 228 1153

To report about complaints/problems the contact details of Secretariat and Chair: Committee of the Faculty of Health Sciences, University of the Free State: 051 – 405 2812

Thank you for your consideration in this regard.

Johan Human

If you consent to participate in the research as described above, please complete the form below and return to the researcher.

The research study, including the above information has been described to me. I understand what my involvement in the study means and I voluntarily agree to participate.

Name:

_____

Signature: _____ Date: _____

Consent from Physiotherapist:

Please indicate if you consent to the athlete participating in the study: Yes/No

Physiotherapists name: _____

Physiotherapists signature: _____

# Terugkeer tot sportdeelname na besering: Ondersoek na die verwantskap tussen die ‘n atleet se tipe motivering en die voorkoms van herbesering.

**Ingeligte toestemming**

Geagte deelnemer

Ons, Johan Human (navorser) en Corlia Brandt (studieleier) doen navorsing oor die motivering van atlete wanneer hul terugkeer na sport en herbesering van die atlete. In hierdie gedeelte van die studie wil ons bepaal of daar enige ooreenkoms is tussen die tipe motivering vir terugkeer na sport na ‘n besering en herbesering.

Ons nooi provinsiale en nasionale atlete wat na afloop van ‘n besering terugkeer na sportdeelname om deel te neem aan hierdie navorsingstudie.

Die deelnemer sal versoek word om vrae in die Aangepaste Sport Motiveringskaal te beantwoord om vas te stel watter tipe motivering hy/sy het om terug te keer na sportdeelname. Voltooiing van die vorm sal ongeveer 30 minute neem. Die atleet se kontakbesonderhede sal slegs op ‘n aparte datalys neergeskryf word met ‘n unieke datanommer vir elke deelnemer. Die deelnemer sal deur die navorser gekontak word om vas te stel of herbesering voorgekom het een week na terugkeer, twee weke, drie weke en daarna op ‘n maandelikse basis tot aan die einde van die seisoen. Die naam van die deelnemer sal nie op die voltooide datalys of die Aangepaste Sport Motiveringskaal van die betrokke deelnemer verskyn nie, maar slegs op die kontak datalys. Die deelnemer kan op enige stadium van deelname aan die studie onttrek. Die resultate van die studie mag gepubliseer word of tydens ‘n aanbieding vertoon word. Daar is geen kostes of betalings vir die deelnemers van hierdie studie nie. Daar is geen risiko vir die afrigter wat deelneem aan hierdie studie nie.

U kan gerus voel om die navorser met enige navrae oor die studie te kontak: Johan Human 083 228 1153

Om enige klagtes/probleme aan te meld kan u die Sekretariaat en Voorsitter: Komittee van die Fakulteit Gesondheidswetenskappe, Universiteit van die Vrystaat kontak: 051 – 405 2812

Baie dankie vir u oorweging.

Johan Human

Indien u toestemming gee vir deelname aan die navorsing soos beskryf hierbo, voltooi asseblief die vorm hieronder en gee dit terug aan die navorser.

Die navorsingstudie, insluitende bostaande inligting is aan my verduidelik. Ek verstaan wat deelname aan die studie behels en ek gee vrywilliglik toestemming vir deelname aan die studie.

Naam:

_____

Handtekening: _____ Datum: _____

Toestemming van ouer/voog:

Dui asseblief aan of u toestemming gee vir die atleet om deel te neem aan die studie: Ja/Nee

Ouer/Voog se naam: _____

Ouer/Voog se handtekening: _____

Toestemming van fisioterapeut:

Dui asseblief aan of u toestemming gee vir die atleet om deel te neem aan die studie: Ja/Nee

Fisioterapeut se naam: _____

Fisioterapeut se handtekening: _____

# Terugkeer tot sport na besering: Ondersoek na die verwantskap tussen 'n atleet se tipe motivering en die voorkoms van herbesering

**U is versoek om aan 'n navorsingstudie deel te neem. Neem asseblief kennis dat deur hierdie vraelys te beantwoord, u vrywilliglik daartoe instem om aan hierdie studie deel te neem. U sal anoniem bly en u data sal ten alle tye konfidensieel hanteer word. U mag op enige oomblik van hierdie studie onttrek terwyl u die vraelys invul. Die resultate van hierdie studie mag gepubliseer word.**

## Ek het na sport terug gekeer na besering:

**Deur van die skaal hieronder gebruik te maak, dui asseblief aan tot watter mate elkeen van die volgende items ooreenstem met die redes waarom jy huidiglik na sportdeelname terugkeer.**

**Vir amptelike gebruik**

R T P ☐☐ 1-2

| | | Stem glad nie ooreen nie | | | Stem matig ooreen | | | Stem presies ooreen | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Want dit is vir my genotvol om meer van my sport te leer. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 3 |
| 2 | Want ek sal sleg voel oor myself as ek nie die tyd neem om dit te doen nie. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 4 |
| 3 | Want ek het die sport gekies as 'n manier om myself te ontwikkel. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 5 |
| 4 | Want mense rondom my beloon my wanneer ek dit doen. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 6 |
| 5 | Want deur sport leef ek in belyning met my diepste beginsels. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 7 |
| 6 | Want deelname aan sport is 'n integrale deel van my lewe. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 8 |
| 7 | Want ek vind dit genotvol om nuwe strategiee te ontdek om te presteer. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 9 |
| 8 | Want ek het gevind dat dit 'n goeie manier is om die aspekte van myself wat ek waarde aan heg, te ontwikkel. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 10 |
| 9 | Want dit is baie interessant om te leer hoe ek kan verbeter. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 11 |
| 10 | Want ek dink ander sal 'n afkeur in my he as ek nie. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 12 |
| 11 | Want dit is een van die beste maniere wat ek gekies het om ander aspekte van myself te ontwikkel | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 13 |
| 12 | Want ek sal nie waardevol voel as ek nie. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 14 |
| 13 | Want mense oor wie ek omgee sal omgekrap met my wees as ek nie. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 15 |
| 14 | Want ek voel beter oor myself as ek doen. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 16 |
| 15 | Want om aan sport deel te neem reflekteer die essensie van wie ek is. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ☐ 17 |

# Return to Sport after Injury: The relationship between an athlete's type of motivation and a recurrence of injury

You have been asked to participate in a research study. Please note that by completing this questionnaire you are voluntarily agreeing to participate in this research study. You will remain anonymous and your data will be treated confidentially at all times. You may withdraw from this study at any given moment during the completion of the questionnaire. The results of the study may be published.

## I returned to sport following injury.

**For official use:**

R T P ☐☐ 1-2

**Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently returning to your sport.**

| | | Does not correspond at all | | | | Corresponds moderately | | Corresponds exactly | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Because it gives me pleasure to learn more about my sport. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 3 |
| 2 | Because I would feel bad about myself if I did not take the time to do it. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 4 |
| 3 | Because I have chosen this sport as a way to develop myself. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 5 |
| 4 | Because people around me reward me when I do. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 6 |
| 5 | Because through sport, I am living in line with my deepest principles. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 7 |
| 6 | Because participating in sport is an integral part of my life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 7 | Because I find it enjoyable to discover new performance strategies. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| 8 | Because I found it is a good way to develop aspects of myself that I value. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 10 |
| 9 | Because it is very interesting to learn how I can improve. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 11 |
| 10 | Because I think others would disapprove of me if I did not. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 12 |
| 11 | Because it is one of the best ways I have chosen to develop other aspects of myself | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 13 |
| 12 | Because I should not feel worthwhile if I did not. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 14 |
| 13 | Because people I care about would be upset with me if I did not. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 15 |
| 14 | Because practicing sports reflects the essence of whom I am. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 16 |
| 15 | Because I feel better about myself when I do. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 17 |

# Data bladsy

R T P 1-2

Voltooi asseblief die volgende:

1 Vandag se datum: (bv 2015/03/15) Y Y Y Y / M M / D D 3-10

2 Wat is jou geboortedatum? (bv 1990/05/26) Y Y Y Y / M M / D D 11-18

3 Wat is jou geslag? Manlik | Vroulik 19

4 Na watter disiplines in atletiek, beplan jy om terug te keer vir deelname gedurende die res van die seisoen? 20-21

| | |
|---|---|
| 1 | Naellope (100m, 200m en/of 4x100m aflos) |
| 2 | Hekkies (90m, 100m, 110m, 300m en/of 400m) |
| 3 | Sponge (hoogspring, verspring, driesprong en/of paalspring) |
| 4 | Worpe (gewigstoot, spiesgooi, diskus en/of hammergooi) |
| 5 | Middelafstande (400m en/of 800m) |
| 6 | Langafstande (meer as 1000m) |
| 7 | Gekombineerde items (veelkamp) |

5 Op watter vlak verteenwoordig jy die sport? 22

| | |
|---|---|
| 1 | Provinsiaal |
| 2 | Nasionaal |

6 Hoe lank neem jy al deel in hierdie sport?

_____jaar 23-24

7 Vir watter tipe besering is jy nou behandel? 25-26

_____

_____

8 Hoe lank was jy vir hierdie besering behandel? 27-28

_____ weke

9 Was hierdie die eerste keer dat jy vir hierdie tipe besering behandel is? Ja | Nee 29

10 Wie het die finale besluit gehad oor of jy gereed was om terug te keer na sportdeelname? 30-31

| | |
|---|---|
| 1 | Jyself |
| 2 | Afrigter |
| 3 | Bestuurder |
| 4 | Dokter |
| 5 | Biokinetikus |
| 6 | Ouers |
| 7 | Fisioterapeut |
| 8 | Ander |

As ander, spesifiseer:

_____

11 Ontvang jy enige van die volgende vergoeding vir jou deelname aan hierdie sport (Merk met X):

| | | |
|---|---|---|
| | Beurs van skool/universiteit | 32 |
| | Borgskap van instansies/persone | 33 |
| | Geen | 34 |

12 Word jy onder druk geplaas om terug te keer na sport deur enige van die volgende (Merk met X):

| | | |
|---|---|---|
| | Ouers | 35 |
| | Afrigter | 36 |
| | Vriende | 37 |
| | Skool | 38 |
| | Universiteit | 39 |
| | Ander | |
| | Indien u ander gekies het spesifiseer asb. | 40-41 |

_____

_____

# Opvolg-data

| | | | | | |
|---|---|---|---|---|---|
| 11 | Week 1 :herbesering? | Ja | Nee | | 42 |
| | Omvang van besering | Identies | Nuut | Verwant | 43 |
| 12 | Week 2 :herbesering? | Ja | Nee | | 44 |
| | Omvang van besering | Identies | Nuut | Verwant | 45 |
| 13 | Week 3 :herbesering? | Ja | Nee | | 46 |
| | Omvang van besering | Identies | Nuut | Verwant | 47 |
| 14 | Week 4 :herbesering? | Ja | Nee | | 48 |
| | Omvang van besering | Identies | Nuut | Verwant | 49 |
| 15 | Maand 2 :herbesering? | Ja | Nee | | 50 |
| | Omvang van besering | Identies | Nuut | Verwant | 51 |
| 16 | Maand 3 :herbesering? | Ja | Nee | | 52 |
| | Omvang van besering | Identies | Nuut | Verwant | 53 |

# Terugkeer tot sport na besering: Ondersoek na die verwantskap tussen 'n atleet se tipe motivering en die voorkoms van herbesering

**U pasiënt is versoek om aan 'n navorsingstudie deel te neem. Neem asseblief kennis dat deur hierdie vraelys te beantwoord, u vrywilliglik daartoe instem dat u pasiënt aan hierdie studie deelneem. U en die pasiënt sal anoniem bly en u data sal ten alle tye konfidensieel hanteer word. U en/of die pasiënt mag op enige oomblik van hierdie studie onttrek terwyl u die vrae beantwoord. Die resultate van hierdie studie mag gepubliseer word.**

## Inligting bekom vanaf Fisioterapeut wat atleet behandel het:

**For official use:**

| R | T | P | | | 1-2 |
|---|---|---|---|---|---|

1 Wat was die diagnose van die atleet? [ ][ ] 3-4

_____

_____

2 Is die atleet volgens u gereed om terug te keer na deelname aan sport? [ ] 5

- [ ] Ja
- [ ] Nee

3 Watter van die volgende mediese faktore het u in ag geneem om te besluit of die atleet gereed is om terug te keer na sportdeelname?

- [ ] Demografie van pasiënt (bv. ouderdom, geslag) [ ] 6
- [ ] Simptome (bv. pyn) [ ] 7
- [ ] Persoonlike Mediese Geskiedenis (bv. herhalende besering) [ ] 8
- [ ] Tekens (fisiese ondersoek) (bv. swelling, swakheid) [ ] 9
- [ ] Laboratoriumtoetse (X-strale, MRB) [ ] 10
- [ ] Funksionele toetse [ ] 11
- [ ] Psigologiese toestand (bv. depressief) [ ] 12
- [ ] Potensiële ernstigheid (bv. konkussie) [ ] 13

4 Watter van die volgende sport risiko veranderlikes het u in ag geneem om te besluit of die atleet gereed is om terug te keer na sportdeelname?

- [ ] Tipe Sport (bv. kontak/nie-kontak) [ ] 14
- [ ] Posisie (bv. voorry of agterry) [ ] 15
- [ ] Dominansie van ledemate [ ] 16
- [ ] Vlak van deelname (bv. rekreasie of professioneel) [ ] 17
- [ ] Vermoë om te beskerm (bv. strapping) [ ] 18

5 Watter van die volgende besluitnemingsveranderlikes het 'n rol gespeel om te besluit of die atleet gereed is om terug te keer na sportdeelname?

- [ ] Tyd van seisoen (bv. proewe of nasionale kampioenskappe) [ ] 19
- [ ] Druk deur die atleet self (bv. om deel te neem) [ ] 20
- [ ] Eksterne druk (bv. ouers, afrigter) [ ] 21
- [ ] Wegsteek van besering (bv. analgetika) [ ] 22
- [ ] Konflik van belange (bv. finansieel) [ ] 23
- [ ] Vrees vir vervolging (bv. toelaatbaarheid om met 'n besering deel te neem) [ ] 24

# Data sheet

**For official use:**

R T P 1-2

Please complete the following:

1 Today's date: (eg 2016/03/15) Y Y Y Y / M M / D D 3-10

2 What is your date of birth? (eg 1990/05/26) Y Y Y Y / M M / D D 11-18

3 What is your gender? Male | Female 19

4 In which disciplines of athletics, do you intend to return to compete in, during the rest of this season? 20-21

- 1 Sprints (100m, 200m and/or 4x100m relay)
- 2 Hurdles (90m, 100m, 110m, 300m and/or 400m)
- 3 Jumps (high jump, long jump, tripple jump and/or pole vault)
- 4 Throws (shot put, javelin, discus and/or hammer through)
- 5 Middle distances (400m and/or 800m)
- 6 Long distances (more than 1000m)
- 7 Combined events (pentathlon and or decathlon)

5 On which level do you represent this sport? 22

- 1 Provincial
- 2 National

6 For how long have you been competing in this sport? 23-24

_____ years

7 What type of injury were you treated for now? 25-26

_____

_____

8 For how long were you treated for this injury? 27-28

_____ weeks

9 Was this the first time that you were treated for this type of injury? Yes | No 29

10 Who had the final say to allow you to return to sport participation? 30-31

- 1 You
- 2 Coach
- 3 Manager
- 4 Doctor
- 5 Biokineticist
- 6 Parents
- 7 Physiotherapist
- 8 Other

If other, please specify:

_____

11 Do you receive remuneration from any of the following for participating in this sport (Mark with X):

- Bursary from school/university 32
- Sponsorship from institutions/persons 33
- None 34

12 Are you pressured to return to sport by any of the following (Mark with X):

- Parents 35
- Coach 36
- Friends 37
- School 38
- University 39
- Other

If your selected other, please specify: 40-41

_____

_____

11 Week 1 :reinjured? Yes | No 42

Extent of injury? Identical | New injury | New but related 43

12 Week 2 :reinjured? Yes | No 44

Extent of injury? Identical | New injury | New but related 45

13 Week 3 :reinjured? Yes | No 46

Extent of injury? Identical | New injury | New but related 47

14 Week 4 :reinjured? Yes | No 48

Extent of injury? Identical | New injury | New but related 49

15 Month 2 :reinjured? Yes | No 50

Extent of injury? Identical | New injury | New but related 51

16 Month 3 :reinjured? Yes | No 52

Extent of injury? Identical | New injury | New but related 53

# Return to Sport after Injury: The relationship between an athlete's type of motivation and a recurrence of injury

**Your patient has been asked to participate in a research study. Please note that by completing this questionnaire you are voluntarily agreeing to participate in this research study. You will remain anonymous and your data will be treated confidentially at all times. You and/or your patient may withdraw from this study at any given moment during the answering of the quetions. The results of the study may be published.**

## Information obtained from physiotherapist that treated the athlete:

**For official use:**

| R | T | P | | | 1-2 |
|---|---|---|---|---|---|

1 What was the diagnosis of the athlete? ☐☐ 3-4

_____

_____

2 Is the athlete, according to you, ready for return to participation in sport? ☐ 5

- ☐ Yes
- ☐ No

3 Which of the following medical factors did you consider to decide if the athlete is ready to return to participation in sport?

- ☐ Patient demographics (e.g. age, sex) 6
- ☐ Symptoms (e.g. pain) 7
- ☐ Personal medical history (e.g. recurrent injury) 8
- ☐ Signs (physical exam) (e.g. swelling, weakness) 9
- ☐ La Tests (e.g. x-ray, MRI) 10
- ☐ Functional Tests (e.g. x-ray, MRI) 11
- ☐ Psychological State (e.g. depressed) 12
- ☐ Potential seriousness (e.g. concussion, tennis elbow) 13

4 Which of the following sport risk modifiers did you consider to decide if the athlete is ready to return to participation in sport?

- ☐ Type of sport (e.g. collision, non-contact) 14
- ☐ Position Played (e.g. goalie, forward) 15
- ☐ Limb Dominance (e.g. MSK alignment) 16
- ☐ Competitive Level (e.g. recreational, professional) 17
- ☐ Ability to Protect (e.g. padding) 18

5 Which of the following Decision Modifiers played a role to decide if the athlete is readey to return to sport?

- ☐ Timing & Season (e.g. playoffs) 19
- ☐ Pressure from Athlete (e.g. desire to compete) 20
- ☐ External Pressure (e.g. coach, athlete family) 21
- ☐ Masking the injury (e.g. effective analgesia) 22
- ☐ Conflict of Interest (e.g. financial) 23
- ☐ Fear of Litigation (e.g. if restricted or permitted) 24

# Return to Sport after Injury: The relationship between an athlete's type of motivation and a recurrence of injury

**Informed consent**

Dear Participant

We, Johan Human (researcher) and Corlia Brandt (study leader) are doing research on the motivation of athletes when returning to sport and the recurrence of injury. In this part of the study we would like to determine what athletic coaches expect from physiotherapists regarding decisions taken about return to sports participation, following an injury.

We invite Bloemfontein athletics coaches to participate in this research study.

The study will consist of an interview by the researcher in your preferred language in Afrikaans or English. The coaches will be asked questions about what they expect from physiotherapists in decisions regarding return to sport after injury. The participant may withdraw from the study at any time. The results of the study may be published and presented. There are no costs or payments involved for the participants. There are no risks to the coach participating in this study.

Feel free to contact the researcher with any further questions regarding the study:

Johan Human 083 228 1153

To report about complaints/problems the contact details of Secretariat and Chair: Committee of the Faculty of Health Sciences, University of the Free State: 051 – 405 2812

Thank you for your consideration in this regard.

Kind regards

Johan Human

If you consent to participate in the research as described above, please complete the form below and return to the researcher.

The research study, including the above information has been described to me. I understand what my involvement in the study means and I voluntarily agree to participate.

Name: _____

Signature: _____ Date: _____

# Terugkeer tot sportdeelname na besering: Ondersoek na die verwantskap tussen die 'n atleet se tipe motivering en die voorkoms van herbesering.

**Ingeligte toestemming**

Geagte deelnemer

Ons, Johan Human (navorser) en Corlia Brandt (studieleier) doen navorsing oor die motivering van atlete wanneer hul terugkeer na sport en herbesering van die atlete. In hierdie gedeelte van die studie wil ons vasstel wat atletiek afrigters van fisioterapeute verwag omtrent besluite rakende terugkeer na sportdeelname, na beserings.

Ons nooi Bloemfonteinse atletiekafrigters uit om deel te neem aan die studie.

Die studie sal 'n onderhoud deur die navorser behels waartydens vrae oor wat afrigters verwag van fisioterapeute rakende besluite oor die terugkeer van atlete na sportdeelname na herstel van 'n besering. Die deelnemer kan op enige stadium van deelname aan die studie onttrek. Die resultate van die studie mag gepubliseer word of tydens aanbiedings vertoon word. Daar is geen kostes of betalings vir die deelnemers van hierdie studie nie. Daar is geen risiko vir die afrigter wat deelneem aan hierdie studie nie.

U kan gerus voel om die navorser met enige navrae oor die studie te kontak:

Johan Human 083 228 1153

Om enige klagtes/probleme aan te meld kan u die Sekretariaat en Voorsitter: Komittee van die Fakulteit Gesondheidswetenskappe, Universiteit van die Vrystaat kontak: 051 – 405 2812

Baie dankie vir u oorweging.

Vriendelike groete

Johan Human

Indien u toestemming verleen om deel te neem aan die navorsing soos hierbo beskryf, voltooi asb die vorm hieronder en gee dit terug aan die navorser.

Die navorsingstudie, asook die die bostaande inligting is aan my verduidelik. Ek verstaan wat my deelname aan die studie behels en ek besluit vrywillig om deel te neem aan die studie.

Naam: _____

Handtekening: _____ Datum: _____

# Terugkeer tot sport na besering: Ondersoek na die verwantskap tussen 'n atleet se tipe motivering en die voorkoms van herbesering

**Instruksies:**

**Merk die gepaste blokkies met 'n X of skryf die antwoord in die spasie daarvoor gelaat.**

Vir amptelike gebruik:
R T S ☐☐ 1-2

1 Wat is u geslag? ☐ 3

☐ 1 Manlik
☐ 2 Vroulik

2 Ongeveer hoeveel jaar ondervinding het u ten opsigte van atletiekafrigting? ☐☐ 4-5

_____ jaar

3 By watter ander sportsoorte is u betrokke ten opsigte van afrigting? U kan meer as een sport aandui. ☐☐ 6-7 ☐☐ 8-9 ☐☐ 10-11

☐ 1 Rugby
☐ 2 Gimnastiek
☐ 3 Netbal
☐ 4 Hokkie
☐ 5 Swem
☐ 6 Landloop
☐ 7 Muurbal
☐ 8 Pluimbal
☐ 9 Sokker
☐ 10 Tafeltennis
☐ 11 Fietsry
☐ 12 Krieket
☐ 13 Golf
☐ 14 Oosterse vegkuns
☐ 15 Waterpolo
☐ Ander, spesifiseer:

4 ☐ 12

Sou u, uself as meer betrokke beskou by atletiekafrigting, as by die afrigting van enige van bogenoemde sportsoorte?

☐ 1 Ja
☐ 2 Nee

5 Hoeveel jaar ondervinding het u met die afrigting van die volgende spesialisvelde?

| | | |
|---|---|---|
| Spronge | _____ jaar | ☐☐ 13-14 |
| Worpe | _____ jaar | ☐☐ 15-16 |
| Naellope | _____ jaar | ☐☐ 17-18 |
| Hekkies | _____ jaar | ☐☐ 19-20 |
| Middel en langafstande | _____ jaar | ☐☐ 21-22 |

6 Het u gedurende die afgelope seisoen (2014/2015) enige atlete afgerig wat sy/haar provinsie in atletiek verteenwoordig het? ☐ 23

☐ 1 Ja
☐ 2 Nee

7 Indien u ja geantwoord het op die vorige vraag, in watter ouderdomsgroepering(s) het hierdie atlete die provinsie verteenwoordig?

☐ Subjeug 24
☐ Jeug 25
☐ Junior 26
☐ Senior 27

8 Het u gedurende die afgelope seisoen (2014/2015) enige atlete afgerig wat Suid-Afrika in atletiek verteenwoordig het? ☐ 28

☐ 1 Ja
☐ 2 Nee

9 Indien u ja geantwoord het op die vorige vraag, in watter ouderdomsgroepering(s) het hierdie atlete Suid-Afrika verteenwoordig?

| | | |
|---|---|---|
| ☐ | Subjeug | 29 |
| ☐ | Jeug | 30 |
| ☐ | Junior | 31 |
| ☐ | Senior | 32 |

10 Wanneer een van u atlete beseer word, moet iemand besluit of die atleet weer gereed is om terug te keer na sportdeelname. Rangskik die volgende belangegroepe in volgorde van die persoon wat volgens u die meeste besluite neem rakende die terugkeer na sportdeelname van u atlete tot die persoon wat die minste besluite neem rakende terugkeer na sportdeelname. Skryf 'n 1 langs die persoon wat die meeste besluite neem, 2 langs die persoon wat die tweede meeste besluite neem ens. Indien daar 'n belangegroep is wat nooit betrokke is by besluite rakende terugkeer na sportdeelname van u atlete nie, kan u 'n nul (0) langs die groep skryf.

| | | |
|---|---|---|
| ☐ | Uself, die sportafrigter | 33 |
| ☐ | Ouers/voogde van die atleet | 34 |
| ☐ | Fisioterapeut | 35 |
| ☐ | Biokinetikus | 36 |
| ☐ | Algemene praktisyn (huisdokter) | 37 |
| ☐ | Sportgeneesheer | 38 |
| ☐ | Onderwyser/persoon aan beheer van atletiek by die skool/klub | 39 |
| ☐ | Sielkundige / Sportsielkundige | 40 |

11 Sou u die volgende van 'n fisioterapeut verwag wat een van u atlete behandel het vir 'n besering?

11.1 Om te besluit wanneer die atleet gereed is om terug te keer na **oefening.** ☐ 41

| | | |
|---|---|---|
| 1 | Ja | ☐☐ 42-43 |
| 2 | Nee | ☐☐ 44-45 |

Bykomende opmerkings: _____

_____

11.2 Om te besluit wanneer die atleet gereed is om terug te keer na **deelname aan sport.** ☐ 46

| | | |
|---|---|---|
| 1 | Ja | ☐☐ 47-48 |
| 2 | Nee | ☐☐ 49-50 |

Bykomende opmerkings: _____

_____

11.3 Om advies te gee oor die hantering van die atleet tydens oefening, om die atleet gereed te kry vir terugkeer na sportdeelname. ☐ 51

| | | |
|---|---|---|
| 1 | Ja | ☐☐ 52-53 |
| 2 | Nee | ☐☐ 54-55 |

Bykomende opmerkings: _____

_____

11.4 Om advies te gee om te probeer verhoed dat die atleet dieselfde besering weer opdoen? ☐ 56

| | | |
|---|---|---|
| 1 | Ja | ☐☐ 57-58 |
| 2 | Nee | ☐☐ 59-60 |

Bykomende opmerkings: _____

_____

11.5 Om die nodige modaliteite in te span (bv. Strapping) om atlete wat slegs geringe beserings opgedoen het, gereed te kry vir deelname? ☐ 61

| | | |
|---|---|---|
| 1 | Ja | ☐☐ 62-63 |
| 2 | Nee | ☐☐ 64-65 |

Bykomende opmerkings: _____

_____

11.6 Om ten alle koste die atleet te verhoed om terug te keer na sportdeelname indien daar selfs die geringste moontlikheid is dat die atleet se besering kan vererger? 66

1 Ja
2 Nee 67-68 69-70

Bykomende opmerkings: _____

11.7 Om atlete in die voorseisoen te evalueer om sodoende moontlike areas te identifiseer wat kan lei tot beserings? 71

1 Ja
2 Nee 72-73 74-75

Bykomende opmerkings: _____

11.8 Om te evalueer of 'n atleet, nie net fisies nie, maar ook psigies gereed is om terug te keer na sportdeelname? 76

1 Ja
2 Nee 77-78 79-80

Bykomende opmerkings: _____

11.9 Om vas te stel wat die tipe motivering vir die atleet is om terug te keer na sportdeelname? 1

1 Ja
2 Nee 2-3 4-5

Bykomende opmerkings: _____

12 Na watter tipe gesondheidsprofessie sou u 'n atleet met die volgende tipe besering eerder verwys vir evaluering en behandeling?

12.1 Ligamentbesering of klagtes? 6

1 Fisioterapeut
2 Biokinetikus
3 Algemene praktisyn (huisdokter)
4 Sportgeneesheer
5 Onderwyser/persoon aan beheer van atletiek by die skool/klub
6 Ander
Spesifiseer: _____

12.2 Spierbesering of klagtes? 7

1 Fisioterapeut
2 Biokinetikus
3 Algemene praktisyn (huisdokter)
4 Sportgeneesheer
5 Onderwyser/persoon aan beheer van atletiek by die skool/klub
6 Ander
Spesifiseer: _____

12.3 Gewrigsbeserings of klagtes? 8

1 Fisioterapeut
2 Biokinetikus
3 Algemene praktisyn (huisdokter)
4 Sportgeneesheer
5 Onderwyser/persoon aan beheer van atletiek by die skool/klub
6 Ander
Spesifiseer: _____

12.4 Senuweeweefselklagtes? ☐ 9

1 Fisioterapeut
2 Biokinetikus
3 Algemene praktisyn (huisdokter)
4 Sportgeneesheer
5 Onderwyser/persoon aan beheer van atletiek by die skool/klub
6 Ander
Spesifiseer: _____

12.5 Atlete wat sukkel met motiveringsprobleme ☐ 10

1 Fisioterapeut
2 Biokinetikus
3 Algemene praktisyn (huisdokter)
4 Sportgeneesheer
5 Onderwyser/persoon aan beheer van atletiek by die skool/klub
6 Sielkundige / Sportsielkundige
7 lewensafrigter ("life coach")
8 Ander
Spesifiseer: _____

13 Indien een van u atlete beseer raak tydens 'n belangrike atletiekbyeenkoms, watter belangegroepe sou u graag wou betrek by besluite of die atleet deelname behoort te staak by die betrokke byeenkoms of indien die atleet kan voortgaan met deelname?

1 Uself, die sportafrigter ☐☐ 11-12
2 Ouers/voogde van die atleet ☐☐ 13-14
3 Fisioterapeut ☐☐ 15-16
4 Biokinetikus ☐☐ 17-18
5 Algemene praktisyn (huisdokter) ☐☐ 19-20
6 Sportgeneesheer ☐☐ 21-22
7 Onderwyser/persoon aan beheer van atletiek by die skool/klub ☐☐ 23-24
8 Sielkundige / Sportsielkundige ☐☐ 25-26
9 Die atleet self ☐☐ 27-28
☐☐ 29-30

Ander, spesifiseer: _____

14 Vir atlete met dieselfde kondisie en dieselfde risiko, kan terugkeer-na-sport besluite beïnvloed word deur omstandighede. Wanneer hierdie faktore geëvalueer word, rangskik asseblief elk van hierdie faktore van 1 tot 6 gebaseer op die belangrikheid wat u daaraan toeskryf. Gebruik elke nommer slegs een keer met 1 as die belangrikste. Gebruik 0 as u glad nie die faktor toepaslik ag nie.

☐ Tydsberekening en seisoen (bv. proewe)
☐ Eksterne druk (bv. afrigter, atleet se gesin) ☐ 31
☐ Druk van atleet (bv. begeerte om deel te neem) ☐ 32
☐ Konflik van belange (bv. finansieel) ☐ 33
☐ Vrees vir vervolging (bv. indien beperk of toegelaat) ☐ 34
☐ Verskuiling van besering (bv. effektiewe analgetika) ☐ 35
☐ 36

15 Dink u dat van u elite atlete soms vroeër terugkeer na deelname aan sport a.g.v. persone, borge of instansies wat druk plaas op die betrokke atlete om terug te keer na sportdeelname? ☐ 37

1 Nooit
2 Soms
3 Gereeld
4 Altyd

16 Sal 'n aanbeveling omtrent die atleet se tipe motivering om terug te keer na sport vir u as afrigter van waarde wees? ☐ 38

1 Nooit
2 Soms
3 Gereeld
4 Altyd

17 Motiveer asseblief u antwoord op vraag 16:

_____ ☐☐ 39-40
_____ ☐☐ 41-42
_____ ☐☐ 43-44
_____

Baie dankie vir u deelname.

# Return to Sport after Injury: The relationship between an athlete's type of motivation and a recurrence of injury

**Instructions**

**Mark the appropriate blocks with a X or write down the answer in the space.**

Official use
R T S ☐☐ 1-2

1 What is your sex? ☐ 3

☐ 0 Male
☐ 1 Female

2 About how many years of experience do you have with regards to coaching athletics? ☐☐ 4-5

_____ years

3 With which other sports are you involved in with regards to coaching? You may indicate more than one option. ☐☐ 6-7 ☐☐ 8-9 ☐☐ 10-11

☐ 1 Rugby
☐ 2 Gymnastics
☐ 3 Netball
☐ 4 Hockey
☐ 5 Swimming
☐ 6 Cross country
☐ 7 Squash
☐ 8 Badminton
☐ 9 Socker
☐ 10 Table tennis
☐ 11 Cycling
☐ 12 Cricket
☐ 13 Golf
☐ 14 Martial Arts
☐ 15 Water polo
☐ Other, specify:

4 Do you consider yourself as being more involved with coaching athletics than coaching any of the above mentioned types of sport? ☐ 12

☐ 1 Yes
☐ 2 No

5 How many years of experience do you have with the coaching of the following specialist fields in athletics?

| | | |
|---|---|---|
| Jumps | _____ years | ☐☐ 13-14 |
| Throws | _____ years | ☐☐ 15-16 |
| Sprints | _____ years | ☐☐ 17-18 |
| Hurdles | _____ years | ☐☐ 19-20 |
| Middle and long distances | _____ years | ☐☐ 21-22 |

6 Did you, during the past season (2014/2015) coach any athletes that represented their province in athletics? ☐ 23

☐ 1 Yes
☐ 2 No

7 If you answered yes to the previous question, in which age group(s) did this/these athlete(s) represent their province?

☐ Sub-youth 24
☐ Youth 25
☐ Junior 26
☐ Senior 27

8 Did you, during the past season (2014/2015) coach any athletes that represented South Africa in athletics? ☐ 28

☐ 1 Yes
☐ 2 No

9 If you answered yes to the previous question, in which age group(s) did this/these athlete(s) represent South Africa?

| | |
|---|---|
| ☐ Sub-youth | ☐ 29 |
| ☐ Youth | ☐ 30 |
| ☐ Junior | ☐ 31 |
| ☐ Senior | ☐ 32 |

10 When one of your athletes is injured, your have to decide when the athlete is ready to return to participation in sport. Arrange the following involved groups in order from the person, that according to you, take most of the decisions regarding return to sport of your athletes to the person that takes least of the decisions regarding return to sport. Write a 1 next to the person with the most decisions, 2 next to the person with the second to most decisions etc. If there are any groups that never take any decisions regarding return to sport of your athletes you may write a zero (0) next to this group.

| | |
|---|---|
| ☐ Yourself, the sport coach | ☐ 33 |
| ☐ Parents/guardians of the athlete | ☐ 34 |
| ☐ Physiotherapist | ☐ 35 |
| ☐ Biokineticist | ☐ 36 |
| ☐ General practioner | ☐ 37 |
| ☐ Sport doctor | ☐ 38 |
| ☐ Teacher/person in charge of athletics at the school/club | ☐ 39 |
| ☐ Psychologist / Sport psychologist | ☐ 40 |

11 Would you expect the following from a physiotherapist that treats one of your athletes with an injury?

11.1 To decide when the athlete is ready to return to training. ☐ 41

☐ 0 Yes ☐☐ 42-43
☐ 1 No ☐☐ 44-45

Additional remarks: _____

_____

11.2 To decide when the athlete is ready to return to participation in sport. ☐ 46

☐ 0 Yes ☐☐ 47-48
☐ 1 No ☐☐ 49-50

Additional remarks: _____

_____

11.3 To provide advice about the handling of the athlete during training sessions in order to prepare the athlete for return to participation in sport. ☐ 51

☐ 0 Yes ☐☐ 52-53
☐ 1 No ☐☐ 54-55

Additional remarks: _____

_____

11.4 To provide advice on how to prevent the athlete from suffering similar injuries in future. ☐ 56

☐ 0 Yes ☐☐ 57-58
☐ 1 No ☐☐ 59-60

Additional remarks: _____

11.5 To use the necessary modalities (e.g. strapping) to assist athletes with minor injuries to participate in sport. ☐ 61

☐ 0 Yes ☐☐ 62-63
☐ 1 No ☐☐ 64-65

Additional remarks: _____

11.6 To at all cost prevent the athlete from returning to sport if there is even the slightest possibility that the injury can worsen. ☐ 66

☐ 0 Yes ☐☐ 67-68
☐ 1 No ☐☐ 69-70

Additional remarks: _____

11.7 To evaluate athletes in the preseason to identify possible areas that may lead to injuries during the season. ☐ 71

☐ 0 Yes ☐☐ 72-73
☐ 1 No ☐☐ 74-75

Additional remarks: _____

11.8 To evaluate if an athlete is not only physically ready, but also psychologically ready to return to sport. ☐ 76

☐ 0 Yes ☐☐ 77-78
☐ 1 No ☐☐ 79-80

Additional remarks: _____

11.9 To determine what the motivation for the athlete is to return to sport. In other words is it really the athlete that wants to return to sport? ☐ 1

☐ 0 Yes ☐☐ 2-3
☐ 1 No ☐☐ 4-5

Additional remarks: _____

12 To which type of health professional would you rather refer an athlete with the following type

of injury?

12.1 Ligament injury or complaints? ☐ 6

1 Physiotherapist
2 Biokineticist
3 General practitioner
4 Sport doctor
5 Teacher or person in charge of athletics at the school/club
6 Other
If other, specify: _____

12.2 Muscle injury or complaints? ☐ 7

1 Physiotherapist
2 Biokineticist
3 General practitioner
4 Sport doctor
5 Teacher or person in charge of athletics at the school/club
6 Other
If other, specify: _____

12.3 Joint injury or complaints? ☐ 8

1 Physiotherapist
2 Biokineticist
3 General practitioner
4 Sport doctor
5 Teacher or person in charge of athletics at the school/club
6 Other
If other, specify: _____

12.4 Nerve injury or complaints? ☐ 9

1 Physiotherapist
2 Biokineticist
3 General practitioner
4 Sport doctor
5 Teacher or person in charge of athletics at the school/club
6 Other
If other, specify: _____

12.5 Athletes who struggles with motivation ☐ 10

1 Physiotherapist
2 Biokineticist
3 General practitioner
4 Sport doctor
5 Teacher or person in charge of athletics at the school/club
6 Psychologist / Sport psychologist
7 Life coach
8 Other
If other, specify: _____

13 If one of your athletes is injured during an important athletics meeting, which persons involved,

would you prefer to involve to decide if the athlete should stop participation at the meeting or if the athlete may continue with participation?

| | | |
|---|---|---|
| 1 | Yourself, the sport coach | 11-12 |
| 2 | Parents/guardians of the athlete | 13-14 |
| 3 | Physiotherapist | 15-16 |
| 4 | Biokineticist | 17-18 |
| 5 | General practioner | 19-20 |
| 6 | Sport doctor | 21-22 |
| 7 | Teacher/person in charge of athletics at the school/club | 23-24 |
| 8 | Psychologist / Sport psychologist | 25-26 |
| 9 | The athlete, him/herself | 27-28 |
| | | 29-30 |

Other, specify: _____

_____

_____

14

For athletes with the same condition and the same risk, return to sport decisions can be influenced by circumstances. When these factors are evaluated, please arrange each of these factors from 1 to 6 based on their importance according to you. Use every number once, starting with 1 as the most important. Gebruik 0 for non-applicable factors.

| | | |
|---|---|---|
| | Timing and season (e.g. playoffs) | 31 |
| | External pressure (e.g. coach, athlete family) | 32 |
| | Pressure from athlete (e.g. desire to compete) | 33 |
| | Conflict of interest (e.g. financial) | 34 |
| | Fear of litigation (e.g. if restricted or permitted) | 35 |
| | Markin the injury (e.g. effective analgesia) | 36 |

15 Do you think that some of your elite athletes return to sport earlier due to pressure to return to participation in sport from persons, sponsors or institutions? 37

| | |
|---|---|
| 1 | Never |
| 2 | Sometimes |
| 3 | Often |
| 4 | Always |

16 Will a recommendation regarding the type of motivation of an athlete to return to sport be of any value to you as a coach? 38

| | |
|---|---|
| 1 | Never |
| 2 | Sometimes |
| 3 | Often |
| 4 | Always |

17 Please motivate your answer to question 16:

_____ 39-40

_____ 41-42

_____ 43-44

_____

_____

# Thank you for your participation