The influence of anxiety and depressive symptoms on social functioning: A person-centred study among South African university students

by

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STUDENT DECLARATION

I, Kaylene Pillay, declare that the research study titled *The influence of anxiety and depressive symptoms on social functioning: A person-centred study among South African university students* is my own original work. This study serves as partial fulfilment of my Master of Social Science in Clinical Psychology at the University of the Free State, Bloemfontein Campus. Consent was obtained by all relevant parties and participants. All literary and academic material and sources consulted during the writing and compilation of this research have been acknowledged and referenced according to the 7th edition of the American Psychological Association's Publication Manual. *Some exceptions may have been made depending on the requirements of the journal targeted for this study.* This work, in its entirety or in part, has not been previously submitted to any other institution for higher education for the fulfilment of a degree. Furthermore, I cede copyright of this dissertation in favour of the University of the Free State.

I certify that the submission of the present research is exclusively for examination purposes at the University of the Free State, and it has not been submitted for any other purpose to a third party.

Kaylene Pillay:  **Date: 17/05/2021**

SUMMARY

The influence of anxiety and depressive symptoms on social functioning: A person-centred study among South African university students

Keywords: anxiety; comorbidity; depression; latent class analysis; social functioning; students

The prevalence of comorbid anxiety and depression among university students is high and results in great impairment of (social) functioning even in subclinical groups. However, the heterogeneity of depression and anxiety profiles and how they affect South African students' social functioning is unknown. Therefore, this cross-sectional survey study investigated the naturally occurring latent groupings formed from anxiety and depression symptoms, and their ability to distinguish levels of social functioning.

Participants were a sample of 1988 university students from South Africa (69.1% female; with a mean age of 21.44 [SD = 3.094], ranging between 17 and 64 years). They completed an online survey comprising the Patient Health Questionnaire-9 (PHQ-9), the Generalised Anxiety Disorder-7 (GAD-7), and the Social Functioning Questionnaire (SFQ). Responses to anxiety and depression symptom indicator variables were subjected to latent class analysis in Mplus. The emergent classes were compared for levels of social functioning using analysis of variance (ANOVA) in SPSS.

Four meaningful classes, showing different levels of symptom endorsement, emerged from the data. Class 1 (20.3%), labelled "Healthy", had the lowest rates of comorbid depression and anxiety symptom endorsement. Class 2 (35.3%), labelled "Anxious exhaustion", had significantly high scores for sleep disturbance, fatigue and other anxiety symptoms. Class 3 (18.3%), labelled "Anxious depression", represented that most severely distressed members with high rates of symptom endorsement for almost all depression and

anxiety symptoms. Lastly, Class 4 (26.1%), labelled “Low distress” was found to have low levels of endorsement of sleep disturbance, excessive worry and irritability.

Although depressive symptoms were found to be more prevalent in this university student sample, it was the classes (class 2 and 3) with the endorsement of higher levels of anxiety symptoms that were found to have poorer social functioning. Furthermore, specific symptoms such as worry and fear, in addition to depression, may be key contributors to poor social functioning among students. The inclusion of students with no diagnoses, as well as a non-clinical population, allowed for the assessment of symptom presentation and severity below the diagnostic cut-offs for depression and anxiety. The findings show a need for better targeted and tailored interventions for student depression and anxiety.

Comorbid depression and anxiety is present in a non-clinical student and a sub-clinical population. Assessing the core symptoms of comorbid depression and anxiety in individuals refines the treatment of a comorbid diagnosis and helps predict the subsequent onset of the full-blown disorder in subclinical individuals. The findings offer student mental health services the scientific evidence to create unique, short-term evidence-based interventions for depression and anxiety. Depression and anxiety symptoms have an adverse effect on social functioning even in a sub-clinical student population. This has implications for psychological intervention for students and poses a challenge for diagnosis effects, as well as policies for mental health promotion at the institutional level. This study serves as empirical evidence for the need for education on mental health and provides a platform for a discussion on mental health problems and mental wellbeing among South African university students.

It is possible that the severity and frequency of symptom endorsement was influenced by Covid-19 and the subsequent lockdown. It would therefore be helpful for future researchers to take this into consideration. This study was only conducted at one South

African university which made the study limited in its generalisability to other universities. Future researchers should consider conducting the study in multiple South African universities. Other limitations included the use of an online survey platform to distribute the questionnaires as well as the study being a cross-sectional study.

LETTER OF PERMISSION/LETTER OF CONSENT

I hereby grant permission for the submission by the first author, Kaylene Pillay, of the following mini-dissertation/article for examination purposes towards the obtainment of a Master of Social Science in Clinical Psychology at the University of the Free State.

The influence of anxiety and depressive symptoms on social functioning: A person-centred study among South African university students

The role of the co-authors were as follows: Prof. I. P. Khumalo supervised the research inquiry with the help of Dr N. F. Tadi who acted as co-supervisor. The authors (Pillay, Khumalo and Tadi) would like to submit the paper/article for publication. The target journal is the *Journal of Affective Disorders.*

Prof. I. P. Khumalo Date: 17/05/2021

STRUCTURE OF THE RESEARCH MINI-DISSERTATION

The present research is submitted in the form of a mini-dissertation as per the requirements for completion of the degree Master of Social Science in Clinical Psychology at the University of the Free State, Bloemfontein Campus. The structure of the mini-dissertation is as follows:

Section 1: Introduction, problem statement and background information. In this section, the researcher introduces the study and provides a review of key concepts and an overview of relevant research pertaining to depression, anxiety, comorbid depression and anxiety and the impact of social functioning This section also aims to contextualise the South African university population and discusses the methodological approach used in this mini-dissertation (pp. 1–50).

Section 2: Journal article. This section contains a manuscript for publication in accordance with the guidelines of the *Journal of Affective Disorders.* This includes the abstract, introduction, methodology used, research findings and discussion of the findings, limitations of the study, conclusion as well as relevant tables and figures (pp. 51–102).

Section 3: Critical reflection by the researcher. In this section, the researcher provides a critical reflection of her experiences while conducting the study. This includes what the researcher has learnt as well as what the study has meant to the researcher (pp. 102–132).

SECTION 1: INTRODUCTION AND PROBLEM STATEMENT

Background and Introduction

Mental Illness

Mental illness is an increasingly prevalent problem which has a negative impact on people and national economies (Doran & Kinchin, 2019; Harnois & Gabriel, 2000; World Health Organisation [WHO], 2011). According to the Global Burden of Disease Study, in 2017 mental disorders affected more than one billion individuals globally (James et al., 2018). Prior to the Covid-19 global pandemic, approximately 20% of the global disease and burden was attributed to mental disorders (Campion et al., 2020). Evidence shows that the widespread nature and impact of mental illness in general populations can be catastrophic (Doran & Kinchin, 2019; Harnois & Gabriel, 2000). In 2011, the World Economic Forum approximated that the economic cost of mental health conditions globally was 2.5 trillion US dollars, with a projected cost of 6 trillion dollars by 2030 (Trautmann et al., 2016).

The Impact of Mental Illness

Mental illness tends to have numerous consequences on people's lives. It can reduce the likelihood of finishing school and obtaining and retaining permanent employment, and limit career opportunities and a good quality of life (Doran & Kinchin, 2019). The Global Burden of Disease Study has consistently identified depressive and anxiety disorders as particularly prevalent and problematic. It reported that over 250 million individuals were affected by depression and anxiety, and anxiety-related disorders (James et al., 2018). Mental health problems such as depression, anxiety and schizophrenia are estimated to be the leading cause of mortality and morbidity globally by 2030 (Doraiswamy et al., 2019).

The Student Population and Mental Health Problems in South Africa

Similarly, an increase in the frequency and severity of mental health problems among students has been observed at institutions of higher learning (Doran & Kinchin, 2019;

Kaminer & Shabalala, 2019; Hambisa et al., 2020). A recent World Health Organisation (WHO) study conducted in 19 universities in eight countries, including South Africa, found that one third of university students reported a history of one or more mental health conditions (Auerbach et al., 2018). This is a phenomenal increase in comparison to a similar study done in 2016 in which a 21-country survey found that one fifth of university students met the criteria for a psychological disorder (Auerbach et al., 2016). In South Africa, Bantjes et al. (2016) and Bantjes et al. (2019) have observed a worrying state of mental illness among South African students. Bantjes et al. (2016) found that 12% of South African university students experience moderate to severe symptoms of depression, while moderate to severe symptoms of anxiety affect 15%. In a later study among first-year university students, Bantjes et al. (2019) found that 24.7% experienced lifetime depression and 22.6% experienced lifetime generalised anxiety disorder.

Impact of Mental Health Problems among University Students in South Africa

There is evidence that the onset of mental illness at university can have profoundly negative consequences for the development of university students (Auerbach et al., 2018). The consequences of mental disorders include adverse effects on future adult occupational functioning (Auerbach et al., 2016), interpersonal relationships and overall physical health (Cuijpers et al., 2019). University students with mental disorders are more likely, in comparison to others, to drop out without obtaining a degree (Storrie et al., 2010). Psychological disorders are important predictors for dropping out of university and academic performance (Auerbach et al., 2016; Bruffaerts et al., 2018). A significant number of students with psychological disorders who do not drop out report an adverse impact on academic performance due to their reduced emotional functioning (Auerbach et al., 2018; Storrie et al., 2010).

Depression and Anxiety

Depression and anxiety have been found to diminish students' ability to manage tasks in different areas of social functioning (Hajduk et al., 2019). Depressive symptoms among university students have been shown to have the following adverse effects: decreased academic performance, higher drop-out rates, decreased optimism regarding the future, negative impact on self-confidence, sleep disturbance and increased suicidality (Cassady et al., 2019; Hysenbegasi et al., 2005; Lun et al., 2018). In addition, depressive symptoms can lead to diminished levels of interest in school and concentration difficulties, which can lead to difficulties in completing tasks (Cassady et al., 2019). Research on anxiety symptoms has shown that this presentation can affect interpersonal relationships, sleep quality and self-confidence (Hajduk et al., 2019; Lun et al., 2018). The near catastrophic proportions of mental illness and the impact on people's functioning have impacts effective prevention, early detection, treatment strategies and a better understanding of mental illness among university students (Cuijpers et al., 2019).

Student Mental Health Services and Policies

In view of the growing concern regarding mental illness, it is incomprehensible that mental health continues to be neglected by policymakers. This reality is seen in the poor policy direction by the African Union Agenda 2063 (see AU Commission, 2015), and the South African National Development Plan (see National Planning Commission, 2013), among others. Both the African Union Agenda 2063 and the South African National Development Plan are similar in that they are both long-term development trajectories (AU Commission, 2015; National Planning Commission, 2013). The AU Agenda 2063 aspirations include fostering a high-quality standard of living and well-being, as well as cultivating healthy individuals (AU Commission, 2015). However, it pays no attention to addressing the mental health of people and communities in the region.

The same could be said for the South African National Development Plan. The National Planning Commission acknowledges the progress and advancements after the transition to a democratic state (National Planning Commission, 2013). It also emphasises that millions of people who were previously excluded from education and healthcare are now receiving them (National Planning Commission, 2013). It goes on to further outline the importance of the South African youth, asserting that the youth of South Africa have the opportunity to positively influence economic growth, increase employment and reduce poverty (National Planning Commission, 2013). Although the Commission delineates a strategy to address the development of the South African youth, it overlooks the importance of their mental health (National Planning Commission, 2013). Therefore, both the AU and the NDP are relatively silent on youth/student mental health. Kaminer and Shabalala (2019) emphasise the dire need for higher education institutions to have a student mental health policy. They argue for a student mental health policy that takes into consideration mental health at an institutional level (informed by the needs of the university), as well as within a South African context (informed by acts, laws and context).

Comorbid Depression and Anxiety

An isolated diagnosis of depression or an anxiety disorder is rare in university students and it is common for depression to co-occur with anxiety (Lun et al., 2018; Makhubela, 2021). However, many empirical studies are focused on the prevalence of depression and anxiety (Bantjes, 2019), and the level of impairment is often studied for each disorder but rarely studied for their possible co-occurrence (Hajduk et al., 2019). Research efforts to understand symptom presentation, and comorbidity are limited (Kircanski et al., 2017).

Comorbid depression and anxiety are challenging because of their heterogenous nature, impairment in functioning, even in sub-clinical manifestation, as well as the difficulty

in assigning a clinical diagnosis. Comorbidity studies neglect the analysis and identification of patterns of symptom co-occurrence. Detailed analyses at the symptom level can be beneficial for understanding patterns of symptom co-occurrence of depression and anxiety, as well as understanding the consequences of their comorbidity (Clark, 2009; Saris et al., 2017; Unick et al., 2009). This is a significant gap in the literature, which the present one-article dissertation aims to address. This study aimed to explore the co-occurring typologies and/or profiles of depression-anxiety, as well as their impact on social functioning in students. This is important because depression and anxiety symptom presentation is complex and requires further investigation in order to improve and extend the reach of student health services (Fried & Nesse, 2015; Unick et al., 2009).

Literature Overview

The purpose of this literature overview is to provide a philosophical stance and a comprehensive introduction to the main concepts and constructs, as well as discuss findings and theoretical positions from previous theoretical and empirical studies. This section will also situate the study within the relevant context, and describe the population from which participants were sought. It will also discuss the theoretical motivation for the specific methodological approach used in the study. The following concepts will be presented and discussed, and placed within the context of a university student setting in South Africa, namely depression, anxiety, comorbid depression and anxiety, and social functioning.

Traditional Clinical Psychology

Clinical psychology is considered to be an applied psychology, the origin of which lies in assessing and addressing what is seen as negative deviations from what is considered "normal" (McReynolds, 1987). Currently, clinical psychology focuses on making meaning and sense of psychological problems (Johnson & Wood, 2017). Clinical psychology research focuses on searching for evidence-based treatments that can be utilised with different

individuals who present with similar symptoms, with a focus on symptom reduction (Johnson & Wood, 2017). As a result, clinicians have developed disorder-specific models to inform and guide clients/patients' treatment (Johnson & Wood, 2017). Clinical psychology differs from other disciplines in terms of underlying assumptions and perspectives (Johnson & Wood, 2017). The underlying assumption of clinical psychology is that most individuals are inherently healthy or "normal", the focus is therefore on helping individuals who seen as unhealthy or "abnormal" to improve so that they lie within the "normal" range (Johnson & Wood, 2017).

Theoretical Framework of Depression and Anxiety

There are many theoretical frameworks that aim to conceptualise both depression and anxiety as isolated disorders. This section will focus on two prevalent and well-known frameworks or approaches to understanding depression and anxiety, namely psychodynamic/psychoanalytic theory, and cognitive theory/cognitive behavioural theory.

Psychodynamic/Psychoanalytic Theory

A prominent figure in conceptualising depression and anxiety was the founder of psychoanalysis, Sigmund Freud. He was so prominent that in the first and second edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM) classification, an understanding of mental disorders was informed by Sigmund Freud's psychoanalytic theory (Tsou et al., 2019). The psychodynamic understanding of depression as defined by Sigmund Freud and later expanded by Karl Abraham is known as the classic view of depression (Sadock & Sadock, 2011). The psychodynamic approach offers a number of explanatory mechanisms for depression and anxiety.

Accordingly, disturbances in the infant–mother relationship in the oral phase (1 to 18 months) predisposes the individual to subsequent depression. Depression can be linked to the avoidance of imagined (perceived) or real object loss. When the acute sadness of

relinquishing an important figure or goal is too distressing, the individual may avoid this feeling by shutting down, becoming insipid and morose (Gipps, 2017; Sadock & Sadock, 2011). Depression results from the unconscious avoidance of anger towards those to whom the individual is attached. This serves the purpose of avoiding the risk of a relational fallout from expressing anger, and as a result the individual unconsciously depletes themselves. The perceived lost object is regarded with a mixture of love and hate, and feelings of anger are directed inward towards the self (depression caused by anger, which is then converted into self-hatred) (Gipps, 2017; Sadock & Sadock, 2011). Introjection of the departed objects is a defence mechanism invoked to cope with the distress linked to the object loss. Introjective depression occurs when an individual feels that they have failed to meet their own standards or the standards of others and as a result they internalise that failure. Introjective depression stems from a harsh, unrelenting, overly critical superego that creates feelings of guilt and worthlessness and a perception of failure (Gipps, 2017; Sadock & Sadock, 2011). Depression may result in the unconscious avoidance of fear. The individual constructs and lives in a dismal and diminished version of themselves, their situation and their future (Gipps, 2017; Sadock & Sadock, 2011).

In the 1890s, Freud's conceptualisation of anxiety proposed that it came from a blocked libido, which meant that when an individual was unable to fulfil a sexual urge, he or she might experience feelings of anxiety (Freeman & Freeman, 2012). Freud termed this "anxiety neurosis" and ascribed the following symptoms to the condition: irritability, deeply ingrained and distressing pessimism, panic attacks, waking up at night in fear, vertigo, various phobias, nausea, hunger or diarrhoea, tingling of the skin and/or numbness (Freeman & Freeman, 2012). The main component of anxiety neurosis according to Freud is the physical symptoms that cause anxiety (Freeman & Freeman, 2012). In 1926, he argued that anxiety arises when an unacceptable drive becomes conscious. Freud defined primary

automatic anxiety, which according to him was triggered by a traumatic situation in which the ego is helpless and overwhelmed (Compton, 1972). The helpless ego prompts anxiety symptoms; this response indicates that danger is near and serves as a warning that a traumatic situation is imminent; defensive measures are then put into place to avoid it (Compton, 1972). Within the psychoanalytic framework, anxiety falls into four categories, namely, impulse anxiety, separation anxiety, castration anxiety and superego anxiety (Freeman & Freeman, 2012).

Cognitive Theory

Depression and anxiety can also be explained by and understood from a cognitive (behavioural) therapy perspective. After years as a psychoanalysis, Aron Beck reputedly became disillusioned with long-term psychodynamic approaches which were based on gaining insight into unconscious drives and emotions. He subsequently came to the conclusion that the way in which people perceived, interpreted and attributed meaning in life was key to reducing psychological distress and changing maladaptive behaviours (Beck, 2008; Miller, 2012). This process was known as "cognition". While working at the University of Pennsylvania, Beck investigated psychoanalytic concepts of depression, which later led to the development of cognitive therapy. By the mid-1970s Beck had expanded his research into depression to include anxiety as well as other psychological disorders (Miller, 2012).

The cognitive model delineates that people's perceptions of, or spontaneous thoughts about, situations influence their physical, emotional and behavioural reactions (Beck, 2008; Miller, 2012). According to this model, the occurrence of negative events and difficulty with environmental situations create negative and dysfunctional attitudes, such as a pessimistic view of the world, the need for perfection, approval and validation, as well as self-coercive ideation (Miller, 2012). Individuals' perceptions are often dysfunctional and distorted when

they are distressed (Beck, 2008; Miller, 2012). These distorted perceptions influence individuals' processing of information, and give rise to their distorted thoughts and behaviours (Beck, 2008; Miller, 2012). Thus, the individual's thoughts, behaviours and emotions are shaped from the view of the world and self. Just as these thoughts, behaviours, and emotions repeat, systematic negative schemas become reinforced autonomously, and are unyielding to external stimuli and resistant to change (Beck, 2008).

A key assumption of cognitive therapy is that every psychological disorder has a distinct cognitive profile. In anxiety, perceived physical or psychological danger is central, while in depression the central theme is loss or deprivation. Beck and Clark (1988) suggest that the schematic organisation of depressed and anxious individuals differs. The schematic organisation of an individual who is clinically depressed is dominated by negativity (Beck & Clark, 1988). A negative cognitive trait is prominent in the depressed person's view of the self, the world and the future (Beck & Clark, 1988). The depressed person sees himself as inadequate, deprived and useless as a result of these negative maladaptive schemas; furthermore they view the world as posing insurmountable challenges, and the future as gloomy and hopeless (Beck & Clark, 1988). On the other hand, maladaptive schemas in the anxious individuals include perceived physical or psychological threat to their personal domain and an exaggerated sense of vulnerability. Moreover, there are different schematic organisational themes in the various subtypes of anxiety (Beck & Clark, 1988). For example, for generalised anxiety disorder (GAD) a variety of life situations are viewed as threatening to one's self-concept (Beck & Clark, 1988). Cognitive schemes serve as a focal point for the interaction of cognitive, affective, motivational, behavioural and neurobiological factors (Beck, 2008). Anxiety and depression share common risk factors and maintenance factors, and in the last several years have been approached through a transdiagnostic lens (Clark, 2009).

Conceptualising Mental Illness

The symptomatic presentation of many psychiatric disorders, including depression and anxiety, is heterogenous in nature (Marquand et al., 2016). By heterogeneity of depression and anxiety, I am referring to variation in signs, symptoms, clinical course and aetiology (Marquand et al., 2016; Monroe & Anderson, 2015). The data-driven classification, clustering and stratification of research (i.e., psychiatric nosology) into psychiatric disorders has allowed for the emergence of different descriptions of disorders over time (Dalgleish et al., 2020; Marquand et al., 2016). For more than a century, the dominant way of conceptualising mental illness and defining mental disorders has been to categorise them using a formal taxonomic system such as the Diagnostic and Statistical Manual of Mental Disorders (DSM; developed in 1952) and the International Classification of Diseases (ICD; developed in 1893) (Dalgleish et al., 2020; Marquand et al., 2016). The DSM is widely used in South Africa. Psychiatric disorders have been classified based on hypothetical distinctions between different sets of signs and symptoms and compiled into comprehensive psychiatric diagnoses (Dalgleish et al., 2020). However, it is possible that these universal classifications can miss the group-specific expressions of psychological distress (Dalgleish et al., 2020).

In 1976, the DSM-III presented a shift towards a neo-Kraepelinian approach, replacing the theoretical and aetiological with an atheoretical and descriptive approach to classifying mental disorders (Aragona, 2014; Tsou et al., 2019). The main difference was that psychoanalysts assumed that psychological mechanisms are pivotal in mental illness and the boundary between abnormality and normality is continuous (ranging from neuroses to psychoses), whereas neo-Kraepelinians assumed that a mental illness is an isolated biological disease with a well-defined boundary between the normal and the “sick” (Ralston, 2019; Tsou et al., 2019). This is a descriptive approach, wherein individuals need to meet a set of

necessary and sufficient criteria (behavioural or observable criteria) to receive a formal diagnosis (Tsou et al., 2019).

The need for empirically validated diagnostic categories prompted the neo-Kraepelinian key assumption that mental disorders should be categorised based on their observable symptoms, rather than on the basis of speculative inferences regarding their causes (Tsou et al., 2019). The DSM-III and its successive editions still make use of that neo-Kraepelinian approach (Tsou et al., 2019). The main distinct methodological difference in the DSM-5 compared to earlier editions is the greater use of dimensional measures. However, it still utilises the general categorical structure of previous DSM editions (Aragona, 2014; Tsou et al., 2019). According to Murphy (2006), the DSM's symptom-based approach towards classification fails to differentiate heterogeneous conditions. This reality is notwithstanding that heterogeneity is a key characteristic of psychiatric disorders, seen in the variation of signs, symptoms, clinical course and aetiology (Marquand et al., 2016; Monroe & Anderson, 2015).

Transdiagnostic Model

Traditional diagnostic systems, which depend on threshold levels and the absolute presence or absence of a psychiatric disorder, as discussed in the previous section, have been under scrutiny. There is some agreement that their clinical utility is limited, and at times, even hinders clinical development (Dalgleish et al., 2020; Fusar-Poli et al., 2019). An alternative to the traditional diagnostic system is the transdiagnostic model, which has gained extensive support as a model that could better represent the clinical and scientific reality of mental illness. The transdiagnostic system focuses on detecting shared and core maladaptive temperamental, psychological, cognitive, emotional, interpersonal and behavioural processes, which underlie a diverse range of diagnostic manifestations (Newby et al., 2015). It has the

ability to reflect and represent the complexity, dimensionality and comorbidity of mental illness (Dalgleish et al., 2020).

The DSM uses threshold levels to determine the definite presence or absence of a classified psychiatric disorder (Dalgleish et al., 2020). According to Dalgleish et al. (2020), many researchers (e.g., Ferdinand et al., 2005; Rudenstine & Espinosa, 2018; Unick et al., 2009) hold the position that there is a lack of sufficient evidence for disorders being distinct categories and go further to suggest that disorders can be better understood along a continuous dimension, taking into consideration subsyndromal disorders (Dalgleish et al., 2020). A major problem with thresholding disorders is that many individuals who experience psychological distress fall short of the criteria required for a formal diagnosis, regardless of the evident impairment in functioning (Dalgleish et al., 2020). Moreover, even those who may be diagnosed with the Major Depressive Disorder (MDD) can have as many as 1030 different symptom configurations of the same illness (Dalgleish et al., 2020).

Epidemiological findings indicate that comorbidity among mental disorders is so prevalent that it should be considered the norm rather than the exception. They further suggest that single, uncomplicated clinical presentations are in fact rare (Dalgleish et al., 2020; Makhubela, 2021; Unick et al., 2009). It has been found that comorbidity of mental disorders is highly intertwined with greater clinical severity and impairment in functioning in individuals (Dalgleish et al., 2020; Ferdinand et al., 2005). Makhubela (2021) makes this point for depression and anxiety among university students in South Africa. Regardless of the clinical utility of the DSM diagnostic categories, there are limitations that cannot be ignored such as the heterogeneity within diagnostic categories (Ferdinand et al., 2005; Newby et al., 2015).

Although originating from cognitive behavioural theories (CBT) and treatments for eating disorders, the transdiagnostic approach was revised to include anxiety and depressive

disorders (Fusar-Poli et al., 2019). The rationale for extending the transdiagnostic approach was informed by the notion that depression and anxiety have commonalities such as aetiological and maintaining processes, as well as shared cognitive-affective, interpersonal and behavioural features (Fusar-Poli et al., 2019). The extension was also informed by the notion that disorder-specific treatments rely on heterogeneous diagnostic criteria and fail to adequately attend to comorbidity (Fusar-Poli et al., 2019). Along with similar aetiological and maintaining processes, depressive and anxiety (anxiety-related) disorders have common genetic, familial and environmental risk factors (Newby et al., 2015). There is also a common distress/negative affectivity component that underlies both depressive and anxiety, and anxiety-related, disorders (Newby et al., 2015). The diagnostic combinations and symptom profiles and clusters have clinical and treatment implications (Marquand et al., 2016; Newby et al., 2015).

The research entailed in this dissertation situates itself in the transdiagnostic model (Dalgleish et al., 2020; Fusar-Poli et al., 2019). With this work, I do not seek to challenge the DSM as a diagnostic classification system, rather, I would like to propose the use of the diagnostic criteria in combination with the transdiagnostic approach, to adequately address the aim, objectives and research hypotheses.

The Heterogenous Nature of Major Depressive Disorder

Depression is a well-known health problem, and has an identifiable history. It is considered to be one of the most easily recognisable psychological disorders due to its similar symptomatic descriptions throughout its history (Horwitz et al., 2016; Solomon, 2001). The core features of depression such as intense sadness, hopelessness, sorrow, dejection, despondency, emptiness, despair and discouragement have remained consistent over time (Horwitz et al., 2016).

The term “depression” is often used as an umbrella term for depressive disorders, as well as clinical depression as a diagnosis (Cai et al., 2020). This research focuses on major depressive disorder which is referred to as depression throughout the study. According to the fifth edition of the DSM, a diagnosis of major depressive disorder can be made when the following diagnostic criteria have been met. At least five of the following nine symptoms have to have been present during the same two-week period (and at least one of the symptoms must be diminished interest/pleasure or depressed mood): depressed mood, loss of interest/pleasure, weight loss or gain, insomnia or hypersomnia, psychomotor agitation, fatigue, feeling worthless or excessive/inappropriate guilt, decreased concentration and thoughts of death/suicide (American Psychological Association, 2013).

The heterogenous nature of depression is recognised and is well documented over time (Fried & Nesse, 2014; Marquand et al., 2016; Monroe & Anderson, 2015). Although individuals diagnosed with depression may have symptoms in common, there are numerous unique clusters of signs and symptoms that certify a formal diagnosis of major depression (Marquand et al., 2016; Monroe & Anderson, 2015). Different studies have identified a large variety of unique combinations of symptoms that all meet the diagnostic requirements for a diagnosis of depression; Fried and Nesse (2015) found 1000 combinations, Ulbricht et al. (2018) found 1400 combinations and Marquand et al. (2016) found 1030 combinations. Thus, two people can be diagnosed with an episode of major depression without sharing any symptom combination (Monroe & Anderson, 2015). Similarly, two individuals diagnosed with depression can have different levels of impairment to their functioning (Fried & Nesse, 2015).

Individual symptoms have been shown to provide insight into psychological functioning and have causal effects on other depressive symptoms (Fried & Nesse, 2015). In other words, not all depression and anxiety symptoms equally predict problems with social

functioning (Hajduk et al., 2019). Eisenberg et al. (2009, as cited in Hajduk et al., 2019, p. 697) found that the "inability to feel pleasure (anhedonia) was a stronger negative predictor of academic success than the depressed mood. These results suggest that despite being severely depressed, many students can still remain relatively functional".

Serial dependencies also exist between symptoms. For example, someone with trouble sleeping will likely experience fatigue or loss of energy and diminished ability to think or concentrate (Monroe & Anderson, 2015). According to Fried and Nesse (2015), insomnia contributes to the development of psychomotor and cognitive impairment, fatigue, depressed mood and suicidality. Depressed mood, loss of interest, poor concentration and fatigue contributed the most to psychosocial impairment, while gaining/losing weight and insomnia/hypersomnia had the least impact on psychosocial functioning (Fried & Nesse, 2014). Individual symptoms were equally debilitating across various psychosocial domains. In their research, Fried and Nesse (2014) found that loss of interest had a significant effect on social and leisure activities, and that fatigue had a significant influence on impairment for home tasks.

To address, in part, the heterogenous nature of depressive symptoms, a shift has been made in order to delineate more homogenous subgroups of symptoms within depression (Van Loo et al., 2012). However, subtyping of depression is not new (Ulbricht et al., 2018). One way involves distinguishing between "typical" and "atypical" (hypersomnia, appetite change, interpersonal sensitivity) types of depression (Sullivan et al., 1998; Unick et al., 2009). Another way of subtyping involves differentials between endogenous (somatic symptoms such as lack of energy and psychomotor retardation) and exogenous (feelings of worthlessness and hopelessness) depression (Unick et al., 2009). Elhai et al. (2012) found empirical support for the two-factor model comprising somatic and non-somatic symptoms.

One approach to identify vital subtypes of depressive symptoms is a data-driven methodological approach, using statistical techniques to identify unique patterns of depressive symptoms in a heterogenous group (Van Loo et al., 2012). Two main forms of latent variable models are latent factor models and latent class models (Van Loo et al., 2012), the latter of which was used in this study. A systematic review done by Van Loo et al. (2012) had no consistent set of depressive subtypes across the 20 articles identified. Latent class analysis (LCA) was used by 10 studies, with 71 significant differences between symptoms scores for classes, 62 of which were related to symptom severity (Van Loo et al., 2012). Therefore, class membership was mainly distinguished by symptom severity (Van Loo et al., 2012).

Ulbricht et al. (2018) conducted a systematic review which identified articles that made use of LCA to explore subtypes of depression among adults. The results showed unique patterns of depressive symptoms, as well as substantial differences between the subtypes identified across the 24 included studies (Ulbricht et al., 2018). Latent classes across the 24 studies were generally differentiated by severity, the endorsed individual symptoms and in corresponding with the DSM criteria of atypical and melancholic depression (Ulbricht et al., 2018). Ulbricht et al. (2018) suggest that more distinct subtypes can be elucidated by integrating other constructs such as functioning.

In another study, Sullivan et al. (1998) acknowledged the heterogeneity of depression and the advantages of clearly defined subtypes based on similar symptoms. Using the National Comorbidity Survey data, the authors applied LCA to 14 DSM-III-R major depressive symptoms in the participants' lifetime worst episodes (N = 2836). Although they focused on atypical depression, by using LCA, Sullivan et al. (1998) identified six classes, as well as subthreshold classes (intermediate and minimal symptom classes). Sullivan et al. (1998) made the following speculations about the "subthreshold" classes: classes may be an

unfinished form of depression, subsyndromal depressive symptoms are associated with significant social consequences, and classes may include individuals who should be diagnosed with depression but have subthreshold symptoms of depression.

The Nature of Generalised Anxiety Disorder (Anxiety)

Like depression, anxiety has a long-standing history. However, generalised anxiety disorder (GAD) does not have the same easily recognisable and distinct core features and symptomatic presentation (Crocq, 2017). In the category of anxiety disorders, GAD is still not as well defined as other disorders, such as obsessive compulsive disorder (OCD) or panic disorder (Richter, 2014). GAD, rather than other anxiety disorders, will be the focus of this study. The term "anxiety" will be used interchangeably with GAD.

In the fifth edition of the DSM, GAD is defined as excessive anxiety and worry about a number of events or activities in different domains, which occurs more days than not for at least six months (APA, 2013). The individual experiencing the excessive worry finds it difficult to effectively control the worry. In order for an individual to be diagnosed with GAD, they have to present with three or more of the following six criteria: restlessness or feeling keyed up or on edge; being easily fatigued; difficulty concentrating or mind going blank, irritability and muscle tension; and sleep disturbance (difficulty falling or staying asleep, or restless unsatisfying sleep) (APA, 2013).

Understanding the heterogenous nature of anxiety symptomatic presentation is a challenging task, which can be made easier by discerning homogenous subgroups (Unick et al., 2009). Attention has been given to interpersonal subtypes within GAD (Salzer et al., 2008), emphasising that an individual's interpersonal attributes influence their interaction with others. Salzer et al. (2008) identified the following four interpersonal clusters/subtypes of GAD; Intrusive, Exploitable, Cold and Non-assertive. On the other hand, Hantouche and Akiskal (2005) make a distinction between psychological anxiety, anxious worry (worry),

anxious phobic (fear) and anxious interpersonal sensitivity (excessive awareness) clusters of symptoms. The distinction between somatic anxiety and psychological anxiety symptoms, even in subclinical manifestations, is key to understanding the overall impairment of anxiety (Unick et al., 2009). Somatic anxiety symptoms (shortness of breath, palpitations, fatigability, muscle tension and restlessness) are more common than psychological anxiety symptoms (excessive worry, uncontrollable worry, emotional lability, sleep disturbance and difficulty concentrating) (Munir et al., 2019). Nonetheless, "worry" (excessive and uncontrollable) also causes significant impairment in functioning (Iani et al., 2019). Iani et al. (2019) found that individuals who presented with GAD attempted to solve perceived or real threats with worry. The inability to cope with the threat often leads to unwanted consequences (i.e. increase in anxiety symptoms) that drive these individuals to continue to use worry as a process of cognitive avoidance (Iani et al., 2019).

Only having a diagnosis of an anxiety disorder is rare, as it often co-occurs with other conditions such as depression (Kessler et al., 2005; Makhubela, 2021; Yonkers et al., 1996). However, this overlap of symptoms between anxiety and other mental disorders becomes an obstacle in delineating GAD as an isolated disorder (Mennin et al., 2008). This comorbidity makes the clinical diagnosis of anxiety complicated (Unick et al., 2009). Symptom diversity and the presence of anxiety symptoms in other diagnostic categories increases this complexity (Van der Heiden et al., 2011). In fact, four out of the six physical symptoms (restlessness, fatigue, difficulty concentrating, sleep disturbance) of anxiety are also present in the diagnostic criteria for depression (Mennin et al., 2008). In addition, four of the symptoms necessitated for depression (disturbance, psychomotor agitation, fatigue and difficulty concentrating) overlap with anxiety diagnostic presentation (Mennin et al., 2008).

Yonkers et al. (1996) conducted a longitudinal study of 164 patients diagnosed with anxiety. The intake interview consisted of a structured clinical interview, thereafter they

conducted a follow-up interview at six-month intervals for two years and then follow-up interviews yearly for one to two years (Yonkers et al., 1996). They found that comorbidity with other disorders was high, and comorbid anxiety affects the chances of remission from just anxiety (Yonkers et al., 1996). The rate of comorbidity between anxiety and depression has been found to be so high that it has often been questioned whether or not anxiety should be an independent disorder (Van der Heiden et al., 2011). The strong relationship between GAD and MDD has been established at both genotypic and phenotypic levels (Van der Heiden et al., 2011). Unick et al. (2009) suggest that the heterogenous nature of GAD can be addressed by not only focusing on comorbidity of depressive and anxiety symptoms, but also by exploring the patterns of symptom co-occurrence.

The Nature of Co-occurring Depression and Anxiety

The DSM-5 is critiqued for not adequately taking into account how symptoms of anxiety and depression interact and the effects of co-morbid anxiety and depression have on functioning (Kircanski et al., 2017)**.** The World Health Organisation study on "Psychological Problems in General Health Care" brought to the forefront the importance of research on comorbid depression and anxiety (Sartorius et al., 1996). In another study, Hirschfeld (2001) found that comorbid depression and anxiety generally manifest as one of four clinical patterns: anxiety disorder, but only subsyndromal levels of depressive symptoms; major depressive disorder, but only subsyndromal levels of anxiety symptoms; anxiety and major depressive disorder; and anxiety and depressive symptoms but not severe enough to meet the diagnostic criteria for a diagnosis.

Given the extensive overlap between depression and anxiety, and the well-documented findings of heterogeneity within these disorders, there is reason to believe that there will be a heterogeneous collection of subtypes of comorbid depression and anxiety (Unick et al., 2009). A study by Rudenstine and Espinosa (2018) goes on to emphasise the

importance of identifying patterns of symptom presentation by grouping symptoms. Their study used data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), in the United States (N = 43,093). They used LCA to assess depression and anxiety symptom subtypes. The following seven classes were found for the whole sample: 1. Severe anxiety – "distressed"; 2. Moderate anxiety and mild depression – "psycho-vegetative depression and anxious"; 3. Worried; 4. Healthy control; 5. Mild depression – "psycho-vegetative depression"; 6. Severe anxiety and severe depression – "hopeless and distressed"; 7. Severe depression – "hopeless" (Rudenstine & Espinosa, 2018). Findings from this study showed that there is a significant heterogeneity in how mood and anxiety symptoms manifest across groups. Subsequently, limited studies to date have been found examining the comorbid symptom manifestation across subpopulations (Rudenstine & Espinosa, 2018).

Hirschfeld (2001) argues that symptomatic but subsyndromal individuals have been found to have a level of impairment closer to that of patients diagnosed with both disorders than that of individuals who report no anxiety or depressive symptoms (Hirschfeld, 2001). Individuals with comorbid depression and anxiety are found to have greater impairment in occupational functioning and psychosocial functioning, as well as a decrease in quality of life compared to individuals without comorbid depression and anxiety (Hirschfeld, 2001). The severity of comorbid depression and anxiety has been documented to have deleterious effects on individuals, such as higher suicidal ideation and increased chances for psychiatric hospitalisation (Hirschfeld, 2001).

In their study of the heterogeneity in comorbidity between depression (MDD) and anxiety (GAD) and its clinical consequences, Unick et al. (2009) used LCA to analyse data from the National Comorbidity Survey (N = 8098). They found seven classes that indicated different levels of clinical distress/consequences: Class 1 (n = 108), lowest rates of symptom endorsement. Class 2 (n = 113) was referred to as "psychological depression", and was

characterised by high endorsement for depressed mood, feelings of worthlessness, and low rates of endorsement for all other symptoms.

Class 3 (n = 191) was referred to as “mild somatic anxiety” and was characterised by a higher rate of endorsement for somatic anxiety symptoms, such as excessive sweating, dry mouth and heart palpitations. Class 4 (n = 222) was referred to as “mixed anxious depression”, and was characterised by the largest rates of endorsement for the depression symptoms; as well as by anxiety symptoms, decreased concentration and decreased sleep. Class 5 (n = 60) was referred to as “anxious misery” and was the smallest class, characterised by increased sleep, changes in appetite, feelings of worthlessness, thoughts of death and high rates of fatigue. When compared to the whole sample, Class 5 endorsed higher levels of somatic anxiety symptoms.

Class 6 (n = 152) referred to as “somatic depressed anxiety”, was characterised by the highest rates of somatic anxiety symptoms and depression symptoms, such as decreased appetite/weight, high rates of decreased sleep and lack of interest. Lastly, Class 7 (n = 162), referred to as “restless somatic depression”, was characterised by high rates of somatic depression symptoms, such as psychomotor retardation/agitation, as well as the highest rates of psychological anxiety symptoms such as feeling fatigued. This class also endorsed relatively high rates of somatic anxiety symptoms compared to the whole study sample (Unick et al., 2009). Class 1, with members with the lowest rates of symptom endorsement, had the least severe clinical distress, whereas Class 7 with the highest symptom endorsement, resulted in the most severe clinical consequences (Unick et al., 2009).

There are numerous benefits of exploring patterns of depressive and anxiety symptom co-occurrence rather than diagnoses, which this recent study aimed to address. First, examining the shared symptoms of depression and anxiety allowed for assessment of heterogeneity in the overlap between these disorders, groupings of symptoms, and types of

people (Unick et al., 2009). Second, focusing on symptoms allowed for the analysis of comorbidity between these disorders below their diagnostic cut-off points (i.e. thresholds), which is not possible when using diagnosis as the focus of analysis (Unick et al., 2009).

Social Functioning and Mental Illness

Impaired social functioning or social dysfunction is central for understanding psychopathology. It is incorporated in the DSM-5 definition of a mental disorder as indicated by:

> A mental disorder is a syndrome characterized by clinically significant disturbance in an individual's cognition, emotional regulation, or behaviour that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning. Mental disorders are usually associated with significant distress in social, occupational, or other important activities (APA, 2013, p. 20).

Thus, the DSM highlights the importance of appraising an individual's social functioning. However, the way in which (social) functioning/dysfunction is defined or conceptualised has enjoyed little consensus among researchers and theorists; it is often found to be determined by the theoretical lens and measurement approach (Goldman et al., 1992; Saris et al., 2017). It is therefore important to appropriately conceptualise and operationalise social functioning in order to position it within this study.

Social functioning, although not unknown to Psychology, has a long-standing history in the literature of Sociology. Social functioning is a concept of social role theory **(**Blakely & Dziadosz, 2007). The purpose of studying the concept of social functioning is to increase the individual's view of self, as well as to address the impairment caused by a psychiatric diagnosis, through exploration and understanding **(**Blakely & Dziadosz, 2007). Another key component of social role theory is adaptation, which is defined as the successful management

of symptoms of mental disorders and the ability to behave in a manner to fulfil the expectations of the individual's social environment **(**Blakely & Dziadosz, 2007).

The conceptualisation of social functioning has enabled clinicians to focus on an individual's current ability to manage social roles and behaviours with the aim of adapting "abnormal" behaviour to a normative status that is accepted and validated by one's society **(**Blakely & Dziadosz, 2007). Behaviours that define the appropriateness of social functioning, or what adaptation is comprised of, are informed by the individuals themselves – in the context of their societal norms – and not imposed by clinicians **(**Blakely & Dziadosz, 2007). Individuals have many social positions, which are often accompanied by expected social roles and behaviours **(**Blakely & Dziadosz, 2007). A key notion that informs social functioning is that people in the same society share the same social role behaviour expectations **(**Blakely & Dziadosz, 2007). It is on this basis that individuals, members of society, and clinicians may notice behaviour that may be deemed to be abnormal **(**Blakely & Dziadosz, 2007).

Consequently, social dysfunction has sometimes been mistaken for disability and notions of social role and social performance have been inaccurately used as measures of social functioning (Tyrer et al., 2005). Remington and Tyrer (1979) found that it was just about impossible to create a social functioning scale without considering the theoretical assumptions of what is required to fulfil a role. According to Blakely and Dziadosz (2007) and Remington and Tyrer (1979), optimal or expected standards of functioning (based on what is normal) classed individuals as either functional or dysfunctional, thus regulating who was "normal" and who was effected by a mental disorder. This approach narrows the difference between social functioning and social dysfunction, and provides an inappropriate yardstick of what constitutes "good" functioning. Remington and Tyrer (1979) and Tyrer et

al. (2005) recognised the importance of assessing social functioning, and moved beyond the preoccupation with "norm-based functioning".

According to Remington and Tyrer (1979), an individual's unique level of impairment can be assessed by allowing a patient, or informants close to the patient, to rate their ability to fulfil and manage tasks (roles). Remington and Tyrer (1979) developed a measure called the Social Functioning Schedule to assess social functioning along a continuum. This allowed for an exploration of the impact of different mental disorders on different individuals in different societies. As outlined in the DSM-5, "mental disorders are usually associated with significant distress in social, occupational, or other important activities" (APA, 2013, p. 3). It is also important to go beyond this stated association, and examine how this level of impairment or dysfunction can be assessed (Roeling, 2010).

Individuals are often limited to diagnostic criteria categorisation, while experiences (impairment) outside of that criteria are afforded little attention (Roeling, 2010). Casey et al. (1985) emphasise the importance of acknowledging and understanding that a patient's psychiatric condition cannot be determined by analyses of their symptom presentation alone. In a study assessing the relationship between social functioning and psychiatric symptomatology of 171 patients, Casey et al. (1985) found that social functioning plays a larger role than symptom severity.

Proposing a new way of thinking about social functioning, Remington and Tyrer (1979) highlighted the distinction between symptoms and social functioning, which often results in different outcomes. Remington and Tyrer (1979) then developed the Social Functioning Schedule, which they introduced to the clinical setting, targeting the assessment of symptomatology, and encouraging clinicians to use their skills to elicit information from patients. Seen as the equivalent of the Social Functioning Schedule, the Social Functioning Questionnaire was developed by Tyrer et al. (2005) in an attempt to address the need for a

quick assessment in the clinical setting. Tyrer et al. (2005) assert that social functioning should be given the same attention as a patient's mental state. The conceptual framework of social functioning postulated by Tyrer et al. (2005) aligns with the way that social functioning is considered and understood in this dissertation.

The Social Functioning Questionnaire addresses the essential aspects of perceived social functioning and allows an individual to rate their social functioning using statements describing good or poor social functioning (Tyrer et al., 2005). It was found that eight domains were sufficient to cover an individual's functioning, namely: 1. Work tasks, 2. Home tasks, 3. Financial concerns, 4. Child care matters, 5. Relationships with family, 6. Sexual activities, 7. Social contacts, 8. Leisure activities. These eight aspects are set in the form of statements describing good or poor social functioning. Each aspect is self-rated and therefore measures perceived social functioning (Tyrer et al., 2005).

Literature indicates that mood disorders, psychotic disorders, stress-related disorders, and anxiety disorders are associated with the high rates of impairment in social functioning are (Roeling, 2010). Depressive symptoms have been found to affect university students in the following ways: decreased academic performance, higher drop-out rates, decreased optimism regarding the future, negative impact on self-confidence, sleep disturbance and increased suicidality (Cassady et al., 2019; Hysenbegasi et al., 2005; Lun et al., 2018). Similarly, anxiety symptoms have been shown to affect interpersonal relationships, sleep quality and self-confidence (Hajduk et al., 2019; Lun et al., 2018). Individuals with comorbid depression and anxiety display greater symptom severity, poorer psychosocial functioning, and overall poorer mental health in comparison with those who suffer from only one of the two conditions (Chen et al., 2019; Saris et al., 2017). A cross-sectional online survey study of 1331 Slovakian university students found that the severity of anxiety and depression were related to the perceived satisfaction with social life, family life, and school (Hajduk et al.,

2019). The Slovakian study found that the social functioning domains affected by comorbid depression and anxiety were mainly social relationships, family life, academic performance and finance (Hajduk et al., 2019).

It can be said that the severity of depression and anxiety is associated with social functioning (Hajduk et al., 2019). Not all depression and anxiety symptoms equally predict problems with social functioning. An individual's level of severity and frequency of one symptom can influence the level of severity and frequency in a different disorder. The level of impairment is therefore influenced by this interaction (Kircanski et al., 2017). Thus, detailed analyses at the symptom level becomes useful in understanding potential differences in comorbid depression and anxiety and can contribute to understanding the degree of impairment resulting from their comorbid nature (Unick et al., 2009).

Setting and Context of Participants

The present study was concerned with the university student population in South Africa. I drew a sample of 2071 students from one of the 26 public universities in South Africa. Universities in South Africa have moved from being elite and racially divided education systems to reflecting inclusion of the national demographical profile (Pather et al., 2017). As a result, universities in South Africa have seen an increased influx of students from different socioeconomic statuses, many of which are first-generation university students (Pather et al., 2017). Kaminer and Shabalala (2019) called for a closer look at student mental health in a university setting, recognising that even a democratic South Africa, with increased access to basic needs such as education and healthcare, is not devoid of human suffering and distress (Kaminer & Shabalala, 2019). The need to address unmet student mental health needs was catalysed by the period of student activism that began in 2015 (Kaminer & Shabalala, 2019). The Rhodes Must Fall (RMF) and Fees Must Fall (FMF) movements both called for better mental health services for students, identifying it as a central aspect of

transformation in a university setting; this was because, in essence, students felt neglected by psychology (Kaminer & Shabalala, 2019).

The transition to university is thought to be stressful, with the potential of precipitating psychological distress and symptoms related to psychiatric/psychological disorders. Starting university typically necessitates leaving home, acclimatising to a new social environment, increased academic pressure, greater chance of students resorting to substance abuse and other risky behaviour, and financial pressure (Bantjes et al., 2019). Psychopathology often co-occurs with this transition as pre-existing mental health issues worsen or as new symptoms develop in response to new environmental stressors (Bantjes et al., 2019). Besides the pressure to perform academically, students are often faced with issues such as social exclusion, sleep deprivation, poverty, high rape and other crime statistics, victimisation and socio-political conflict (Van Breda, 2017). These challenges often lead to students being predisposed to anxiety and depression (Van Breda, 2017). Researchers have found that a high numbers of university students in South Africa experience psychosocial vulnerability that is directly related to different social domains such as academic success, social withdrawal and interpersonal relationships (Van Breda, 2017; Sakala, 2018).

All South African universities are statutory bodies governed by acts of parliament such as the Higher Education Act 101 of 1997 (Department of Education, 1997). Mental health policies are governed by the Mental Health Care Act 17 of 2002 (Szabo & Kaliski, 2017). The latter Act has been said to be founded on the ten basic principles set out by the World Health Organization (WHO) guiding mental healthcare law which puts forward that access mental health services like access to basic healthcare services is considered to be a universal right (Kaminer & Shabalala, 2019; Mental Health Care Act, 2002; Szabo & Kaliski, 2017). Furthermore, an emphasis on promoting and understanding mental illness is vital to

improving the lives affected by mental illness (Kaminer & Shabalala, 2019; Mental Health Care Act, 2002; Szabo & Kaliski, 2017).

It is therefore surprising that South African universities do not have formal policies on student mental health (Kaminer & Shabalala, 2019). Furthermore, Kaminer and Shabalala (2019) found that students and staff should be consulted in order to create a policy that takes into account the political, socioeconomic, cultural and higher education contexts in South Africa. Kaminer and Shabalala (2019) suggest that universities should aim to create their own institutional strategies to address the mental health needs of their university students.

More often than not a diagnosis does not lead to treatment-seeking behaviour, therefore leaving a mental health treatment gap among university students (Bantjes et al., 2020). Patterns of student mental health services are influenced by the accessibility of services, perception of need, uncertainty regarding the effectiveness of treatment, stigma and lack of knowledge (Kaminer & Shabalala, 2019). Students with a sub-threshold diagnosis of depression and anxiety often "fall through the cracks" and their mental health needs often go unnoticed and untreated (Barrable et al., 2018).

South Africa has a unique population that represents a blend of its various cultures, making the practice and study of psychology unique (Cooper & Nicholas, 2012). Studies on mental health in South Africa display the complex context in which mental health and mental illness should be considered (Pillay, 2019). The same complexity should be considered when studying mental illness in a university population. Therefore, this study aims to explore mental illness, namely depression and anxiety, in university students while exploring social functioning.

Methodological Issues and Statistical Data Analysis Approaches

Positivist Paradigm

A positivistic paradigm informs my dissertation, and the lens through which I view the world and clinical psychology. Kuhn (1970) defined a paradigm as an intellectual platform for the scientific community to communicate and construct knowledge. A paradigm is believed to consist of three interrelated elements, namely ontology, epistemology and methodology (Guba & Lincoln, 1998). In a positivist paradigm, research is addressed using the benchmark of validity, reliability and objectivity (Guba & Lincoln, 1998). Chilisa and Kawulich (2012) view the positivistic paradigm as informed mainly by realism, idealism and critical realism; geared towards discovering laws that are generalisable and govern the universe. It is important to note that the difficulty of the positivist paradigm is the assumption of objectivity and the lack of exploring subjective experiences (Chilisa & Kawulich, 2012).

The assumption of objectivity is translated in quantitative research through the use of measuring instruments and reliance on quantifying variables (Pham, 2018). I applied a quantitative research methodology and utilised the following research tools: correlational, quasi-experimental, experimental, causal comparative and surveys (Chilisa & Kawulich, 2012). Positivists see knowledge as statements of belief that can be empirically tested, can be confirmed/verified or, in contrast, can be disconfirmed (Chilisa & Kawulich, 2012; Pham, 2018). The positivist paradigm enables researchers to clearly understand the objects by means of empirical tests and methods such as observation, questionnaires and focus group discussions (Chilisa & Kawulich, 2012; Pham, 2018). This suggests that insights provided by positivist researchers may have high validity and reliability, such that they can be generalised to population at large (Pham, 2018). What is often negated when following a rigid criterion, is the unique experience of the individual. The measurements (PHQ-9, GAD-7 and SFQ)

used were aligned with the positivist method paradigm. The use of the SFQ enabled the researcher to analyse the subjective consequences of these comorbid disorders.

Measurements Used

A diagnosis of depression and anxiety is currently dependent on the defined criteria as set out in the DSM. When making a formal diagnosis, mental health practitioners are expected to avoid subjective bias, by making use of the standardised criteria set out by the DSM. This relatively objective method of diagnosing an individual with a mental disorder is important to ensure a standardised approach. The diagnostic criteria of depression and anxiety established by scientific research include validity, reliability and objectivity. However, with this rigid approach the chances of missing the unique experience of the individual are high. With this in mind the following three measurements were deemed fit to not only address the positivist method of depression and anxiety, but also allowed the researcher to analyse the subject consequences of these comorbid disorders.

The PHQ-9 (Kroenke et al., 2001). The decision to make use of the PHQ-9 for the screening of depression in this research was driven by the positivist paradigm. The PHQ-9 is considered to be one of the most validated screening tools in mental health (Hajduk et al., 2019; Lun et al., 2018). It is based on the nine diagnostic criteria required for major depressive disorder as defined in the DSM-5. Research has indicated that the cut-off scores proposed by Kroenke et al. (2001) are strongly correlated with a subsequent major depression diagnosis. The usefulness of the PHQ-9 is that it functions as a screening tool, an aid in making a formal diagnosis, and as a tool that can effectively track symptoms that can help monitor an individual's overall depression severity, as well as monitor specific symptoms (Kroenke et al., 2001).

The GAD-7 (Spitzer et al., 2006). The GAD-7 was used to measure anxiety symptoms. The differences in symptom presentation (severity and frequency) can be

objectively measured with the GAD-7. Although this was not a prevalence study, numerical information was vital to address the aim, objectives and research questions. Similar to the PHQ-9, numerical data based on reliable and valid measurements was necessary for the data driven approach of creating subtypes and profiles (Spitzer et al., 2006*).*

The Social Functioning Questionnaire (Tyrer et al., 2005). The experience of a mental disorder is generally used to legitimise the diagnosis. A diagnosis is made when individual subjective experiences meet the diagnostic criteria outlined by the DSM. The DSM acknowledges that psychopathology causes distress in social functioning. The DSM's assessment of symptoms and social functioning does not encompass all areas of social functioning. Remington and Tyrer (1979) aimed to create an assessment that was able to measure all areas of social functioning for a variety of individuals. These areas include work and home tasks, financial concerns, childcare matters, relationships with family, sexual activities, social contacts and leisure activities. The authors noted that certain domains in the questionnaire will be more relevant to certain individuals (Remington & Tyrer, 1979). Therefore, due to the nature of the diverse population studied, the researcher was of the opinion that the Social Functioning Questionnaire based on the Social Functioning Schedule was best suited.

Latent Class Analysis as a Person-centred Methodological and Analytical Approach

Heterogeneity is a key feature of most, if not all, mental disorders (Marquand et al., 2016). One way of addressing the heterogeneity of mental disorders is by sub-typing them. Data-driven approaches to address heterogeneity in mental disorders have been used for many years, using statistical techniques (such as data clustering methods) to partition clinical groups into more homogeneous subgroups (Marquand et al., 2016). In recent years, researchers have been encouraged to think beyond fixed diagnostic criteria and find new ways of classifying

disorders based on symptom dimensions (Marquand et al., 2016). LCA in particular is a widely used approach for addressing the heterogenous nature of mental disorders (Marquand et al., 2016).

Person-oriented methods such as LCA enable the researcher to use individual differences and compare those to the dependent variable (Rosato & Baer, 2012). LCA is used to identify the smallest number of latent classes that describe the connection among a set of observed indicators using their posterior probabilities (Rosato & Baer, 2012). In its focus on dividing the cases/sample of individuals, LCA is similar to that applied by factor analysis in variable-based computations (Rosato & Baer, 2012). LCA posits that there is an "underlying, unobserved categorical variable that divides a population into mutually exclusive and exhaustive latent classes" (Lanza & Rhoades, 2013, p. 3).

It remains a matter of discussion whether dissimilar symptom mechanisms will influence the prediction of psychiatric outcomes, and whether this is affected by the sample size and type (De la Cruz et al., 2018. Therefore, LCA is a model-based method used to identify latent groups or categories based on relationship among participants (Rosato & Baer, 2012; Schreiber, 2017).

The use of LCA in the present study means that the researcher followed a data-driven person-centred process of exploring unobserved latent classes within the university student population, based on individual responses of the nine items of the Patient Health Questionnaire (PHQ-9) and the seven items of the Generalised Anxiety Disorder Questionnaire (GAD-7). This allowed the researcher to observe the nature of each class, as well as differentiate the presentation of comorbid anxiety and depression, and their impact on social functioning in the different domains.

Aim of the Study

The present study examined the role of depression and anxiety symptoms in the social functioning of university students, by investigating how depression and anxiety symptom latent classes distinguish levels of social functioning. Two objectives were pursued. First, LCA was conducted on the combined depression and anxiety symptoms. Second, the group mean differences of social functioning across the emergent latent classes were investigated. This was to answer the research question: How do naturally occurring latent classes of depression and anxiety symptoms distinguish the social functioning levels amongst university students? Based on the literature it is hypothesised that depressive and anxiety symptoms will yield heterogeneity of presentation across parsimonious latent classes (Rudenstine & Espinosa, 2018). Greater endorsement of depressive symptoms is more likely to co-occur with higher anxiety symptoms, with the inverse also being probable. It was further hypothesised that the combination of depressive and anxious symptoms would be associated with impaired social functioning (Hajduk et al., 2019).

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SECTION 2: JOURNAL ARTICLE

This section contains a manuscript for publication in accordance with the guidelines of the *Journal of Affective Disorders* (guidelines are outlined below). This includes the abstract, introduction, methodology used, research findings and discussion of the findings, limitations of the study, conclusion as well as relevant tables and figures, The authors (Pillay, Khumalo, and Tadi) would like submit the paper/article for publication. Many sections exceed the wordcount stipulated by the target journal, these sections will be refined before submission of the article.

Journal Guidelines

The *Journal of Affective Disorders* was selected for submission of the present manuscript. The following guidelines should be noted for the manuscript submission.

Title Page

The title page should include:

- Author names and Title
- Footnote with the corresponding author's full contact information (address, telephone, fax numbers and email addresses)

Abstract

A structured abstract of no more than 250 words should appear on a separate page with the following headings in order: Background, Methods, Results, Limitations, Conclusion (which should contain a statement about the clinical relevance of the research).

Keywords

A list of three to six key words should appear under the abstract.

Text

Text formatting

- Good English
- American or British usage is accepted, both not a mixture of both.

Abbreviations

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

Footnotes

Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors can build footnotes into the text, and this feature may be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of the article. Do not include footnotes in the reference list.

Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article etc.).

References

Citation in text

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results

and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

Reference Style

Text: All citations in the text should refer to:

1. Single author: the author's name (without initials, unless there is ambiguity) and the year of publication;

2. Two authors: both authors' names and the year of publication;

3. Three or more authors: first author's name followed by 'et al.' and the year of publication.

Citations may be made directly (or parenthetically). Groups of references can be listed either first alphabetically, then chronologically, or vice versa.

Examples: 'as demonstrated (Allan, 2000a, 2000b, 1999; Allan and Jones, 1999)…. Or, as demonstrated (Jones, 1999; Allan, 2000)… Kramer et al. (2010) have recently shown …'

List: References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', 'c', etc., placed after the year of publication.

Examples:

Reference to a journal publication:

Van der Geer, J., Hanraads, J.A.J., Lupton, R.A., 2010. The art of writing a scientific article. J. Sci. Commun. 163, 51–59. https://doi.org/10.1016/j.Sc.2010.00372.

Reference to a journal publication with an article number: Van der Geer, J., Hanraads, J.A.J., Lupton, R.A., 2018. The art of writing a scientific article. Heliyon. 19, e00205. https://doi.org/10.1016/j.heliyon.2018.e00205.

Reference to a book: Strunk Jr., W., White, E.B., 2000. The Elements of Style, fourth ed. Longman, New York.

Reference to a chapter in an edited book: Mettam, G.R., Adams, L.B., 2009. How to prepare an electronic version of your article, in: Jones, B.S., Smith , R.Z. (Eds.), Introduction to the Electronic Age. E-Publishing Inc., New York, pp. 281–304.

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Tables

- Tables should be submitted as editable text and not as images.
- Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end.
- Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body.
- Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article.
- Please avoid using vertical rules and shading in table cells.

Article Manuscript

The influence of anxiety and depressive symptoms on social functioning: A person-centred study among South African university students

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Target journal

Journal of Affective Disorders

Correspondence

Abstract

Background: The prevalence of comorbid anxiety and depression among university students is high and causes impairment of (social) functioning even in subclinical groups. However, the heterogeneity of depression and anxiety profiles and how they affect South African students' social functioning are unknown. Therefore, this cross-sectional survey study investigated the naturally occurring latent groupings formed from anxiety and depression symptoms, and their ability to distinguish levels of social functioning.

Method: A sample of 1988 participants (69.1% female; with a mean age of 21.44 [SD = 3.094], ranging between 17 and 64 years) completed an online survey comprising the Patient Health Questionnaire-9 (PHQ-9), the Generalised Anxiety Disorder-7 (GAD-7), and the Social Functioning Questionnaire (SFQ). Responses to anxiety and depression symptom indicator variables were subjected to latent class analysis in Mplus. The emergent classes were compared for levels of social functioning using ANOVA in SPSS.

Results: Four meaningful classes, showing different levels of symptom endorsement, were extracted. The classes depicted the following profiles: Class 1 (20.3%) "Healthy", Class 2 (35.3%) "Anxious exhaustion", Class 3 (18.3%) "Anxious depression" and Class 4 (26.1%) "Low distress". Depressive symptoms were more prevalent across classes. Those with the endorsement of higher levels of anxiety symptoms had poorer social functioning. Certain symptoms were found to be key contributors to poorer social functioning.

Limitations: A major limitation was that the analyses were based on cross-sectional data, therefore the stability of the latent classes over time cannot be verified in this study.

Conclusion: Although depressive symptoms were found to be more prevalent in this university student sample, it was the classes with the endorsement of higher levels of anxiety symptoms that were found to have poorer social functioning. The findings show a need for better targeted and tailored interventions for student depression and anxiety.

Abstract wordcount = 295

Keywords: anxiety; depression; comorbidity; social functioning; latent class analysis; students

The influence of anxiety and depressive symptoms on social functioning: A person-centred study among South African university students

Mental illness is an increasingly prevalent problem, which has a negative impact on people and national economies (Doran & Kinchin, 2019; Harnois & Gabriel, 2000; World Health Organisation, 2011). At the same time, the prevalence of mental health problems is increasing in number and severity among students at institutions of higher learning (Cheung et al., 2020; Doran & Kinchin, 2019; Kaminer & Shabalala, 2019; Hambisa et al., 2020). A recent World Health Organization (WHO) study conducted in 19 universities in eight countries, including South Africa, found that one third of students reported a history of one or more psychological disorders (Auerbach et al., 2018). This is a phenomenal increase in comparison to a similar study done in 2016, in which a 21-country survey found that one fifth of university students met the criteria for a psychological disorder (Auerbach et al., 2016). In general, anxiety and depression make up approximately 50% of the international disease burden attributed to psychiatric disorders (Whiteford et al., 2013). In fact, anxiety and depression make up two out of the six most prevalent disorders found among students (Auerbach et al., 2018).

Studies show an unfavourable state of mental health among South African students (Bantjes et al., 2016; Bantjes et al., 2019; Kaminer & Shabalala, 2019). Students at universities in South Africa are predisposed to anxiety and depression (Rousseau et al., 2021; Van Breda, 2017). Furthermore, depression is known to frequently coexist with other mental illnesses, especially anxiety (Makhubela, 2021). This state contributes to poorer academic performance, increased risky behaviour, and a drop in the quality of interpersonal relationships (Sakala, 2018). Bantjes et al. (2016) found that 12% of university students in South Africa experienced moderate to severe symptoms of depression, while 15.8% experienced moderate to severe symptoms of anxiety. A number of factors, such as poor

personal goals, high level of anxiety, negative cognitions regarding success, inadequate emotional adjustment to university, being female, lack of autonomy from parents, as well as sexual orientation, predispose students to depression (Villatte et al., 2017). Besides the pressure for academic performance, students also report issues such as social exclusion, sleep deprivation, poverty, high rape and other crimes, socio-political conflict, as well as other forms of victimization (Van Breda, 2017).

Symptoms and Diagnosis of Depression and Anxiety

Previous depression and anxiety studies made use of categorical diagnostic constructs or dimensional measures of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; and prior editions) to assess distinctions and associations between depression and anxiety (Dalgleish et al., 2020; Ferdinand et al., 2005). The use of categorical diagnostic constructs can result in loss of valuable information about comorbidity, because those who score just below the diagnostic threshold maintained by the DSM are often neglected, regardless of the evident impairment in functioning (Dalgleish et al., 2020; Ferdinand et al., 2005). A dimensional approach does not solve this problem either because it cannot be used to divide individuals into homogeneous subgroups (Ferdinand et al., 2005). Data-driven methods have been used to address the shortcomings of categorical and dimensional approaches. Unick et al. (2009) and Rudenstine and Espinosa (2018) emphasise the unique presentation of the overlap in depressive and anxiety symptoms. Two studies by Rudenstine and Espinosa (2018) and Unick et al. (2009) used latent class modelling and observed seven distinct profiles of depressive and anxiety symptomatic presentation. Both studies found that the overlap of depression and anxiety symptoms had clinically meaningful implications (Rudenstine & Espinosa, 2018; Unick et al., 2009).

Effects of Depression and Anxiety on Student Life

Together and separately, depressive and anxiety symptoms affect university students adversely. The following effects are attributed to depression: decreased academic performance, higher drop-out rates, decreased optimism regarding the future, negative impact on self-confidence, sleep disturbance and increased suicidality (Cassady et al., 2019; Hysenbegasi et al., 2005; Lun et al., 2018). Anxiety symptoms have been shown to have a negative impact on interpersonal relationships, sleep quality and self-confidence (Hajduk et al., 2019; Lun et al., 2018).

An isolated diagnosis of depression or anxiety disorder is rare, with depression in university students known to commonly co-occur with anxiety (Lun et al., 2018; Makhubela, 2021). The level of impairment associated with depression and anxiety is often studied for each disorder, but their possible co-occurrence is rarely given attention (Hajduk et al., 2019). What is known, however, is that individuals with comorbid depression and anxiety display greater symptom severity, poorer psychosocial functioning, and overall poorer mental health in comparison with those who suffer from only one of the two conditions (Chen et al., 2019; Saris et al., 2017). Detailed analyses at the symptom level can be beneficial for understanding patterns of symptom co-occurrence in depression and anxiety, as well as understanding the consequences of their comorbidity (Unick et al., 2009).

Social Functioning as an Outcome of Depression and Anxiety

Researchers have found that a high numbers of university students in South Africa experience psychosocial vulnerability that is directly related to different social domains such as academic success, social withdrawal and interpersonal relationships (Van Breda, 2017; Sakala, 2018). Comorbid depression and anxiety are found to have even greater deleterious effects on the ability to fulfil academic roles and responsibilities (Bitsika & Sharpley, 2012; Ngin et al., 2018), while diminishing students' ability to manage tasks in different areas of

their social domains (Hajduk et al., 2019). According to Tyrer et al. (2005), the impairment caused by poor social and psychiatric symptoms should be taken into consideration when determining a psychiatric condition. The present study uses the conceptual and operational model of Tyrer et al. (2005) to conceptualise and measure the perceived social functioning of university students. According to this model, social functioning is defined as a subject's own feelings about their functioning and symptoms, emphasising that the individual rates their social functioning as good or poor. This conceptual model of social functioning encompasses the essential domains of social interaction, namely, work and home tasks, financial concerns, relationships with family, sexual activities, social contacts, and spare time activities (Tyrer et al., 2005).

Context of the Study

Universities in South Africa have moved from a previously elite and racially divided education system to one which reflects the national demographics (Pather et al., 2017). As a result, universities have seen an increased influx of students from different socioeconomic status groupings, many of which are first-generation university students (Pather et al., 2017). The call to address unmet student mental health needs was catalysed by the period of student activism that took place between 2015 and 2016 (Kaminer & Shabalala, 2019). The Rhodes Must Fall (RMF) and Fees Must Fall (FMF) movements both called for better mental health services for students, identifying it as a central aspect of transformation in South African universities (Kaminer & Shabalala, 2019). In low- and middle-income countries (LMICs) such as South Africa, cultural influences and beliefs regarding mental illness, and lack of access to mental health education and facilities, may lead to the neglect of mental health on both an individual and an institutional level (Meyer et al., 2018).

The Present Study

Current literature shows that social functioning impairments have been largely analysed separately for depression and anxiety, thus overlooking comorbidity (Saris et al., 2017). This research gap is addressed in the present study by exploring the effect of unique combinations of anxiety and depression on social functioning. Therefore, this study examined the role of depression and anxiety symptoms in the social functioning of university students, by investigating how depression and anxiety symptom latent classes distinguish levels of social functioning. Two objectives were pursued. First, latent class analysis (LCA) of the combined depression and anxiety symptoms was conducted. Second, the group mean differences of social functioning across the emergent latent classes were investigated. These objectives aimed to answer the research question: How do naturally occurring latent classes of depression and anxiety symptoms distinguish the social functioning levels of university students? Based on the literature, it is expected that depressive and anxiety symptoms will yield heterogeneity of presentation across parsimonious latent classes (Rudenstine & Espinosa, 2018). Greater endorsement of depressive symptoms is more likely to co-occur with higher anxiety symptoms, with the inverse also being probable. It was further hypothesised that the combination of depressive and anxious symptoms would be associated with impaired social functioning (Hajduk et al., 2019).

Method

Research Design

The present study employed a quantitative online cross-sectional survey (cf. Creswell, 2014; Maree, 2007). According to Creswell (2014), quantitative research is a deductive process where theoretical models expressing relationships between variables are tested in the data. Instead of the variable-based analysis, this study applied a person-centred approach in

the form of LCA to investigate intragroup heterogeneity (Nylund et al., 2007; Rosato & Baer, 2012).

Participants

A convenience sample of 1988 university undergraduate students between the ages of 17 and 64 years from a university in South Africa participated in this study. The sample size initially comprised 2071 participants, but after the data set was cleaned the resultant sample comprised 1988 participants (see Kline, 2015). The complete data set was achieved by including only the cases with complete information for the PHQ-9, GAD-7 and SFQ. The majority of the sample consisted of Black students at 84.3%, while 8.9% were White, 5.8% were Coloured, and 0.9% were Indian/Asian. The five most spoken home languages were Sesotho (23.9%), isiZulu (20.0%), isiXhosa (12.3%), Afrikaans (10.4%) and Setswana (9.8%). The participants came from all faculties, namely Economic Management (17.3%), Education (19.4%), Health Sciences (4.9%), Humanities (26.0%), Law (10.5%), Natural and Agricultural Sciences (20.3%), and Theology and Religion (1.6%). First-year students comprised 36.4% of the participants and, lastly, the majority of the participants were single (96.8%). These demographic frequencies and percentages are displayed in Table 1.

< Table 1 approximately here >

Measuring Instruments

***Patient Health Questionnaire 9-item scale (PHQ-9; Kroenke, Spitzer, & Williams, 2001*).** The PHQ-9 consists of nine items enquiring about the presence and severity of depression symptoms over the past two weeks. The items consist of the DSM-5 criteria for a depressive episode. The scale is scored on a four-point frequency Likert type scale, ranging from 0 (*"not at all"*) to 3 (*"nearly every day"*). Previous studies have found the PHQ-9 to have good psychometric properties. In the original study, Kroenke et al. (2001) found Cronbach's alphas of .86 and .89. It was also found to be reliable among Nigerian students,

with a Cronbach's alpha of .85 and test-retest reliability of .89 (Adewuya et al., 2006). In South Africa, Bhana et al. (2015) found a Cronbach's alpha of .76 among chronic care patients. The present study found the Omega composite reliability index of .84 for the unidimensional model.

Generalized Anxiety Disorder 7-item scale (GAD-7;* Spitzer, Kroenke, Williams, & Löwe, 2006*). The GAD-7 was designed to assess generalised anxiety symptoms over the last two weeks. The items enquire about the degree to which the individual has experienced anxiety symptoms such as feeling nervous, anxious or on edge, excessive worrying, restlessness, irritability or becoming easily annoyed. It is scored on a frequency Likert-type scale ranging from 0 ("*not at all"*) to 3 ("*nearly every day"*). Spitzer et al. (2006) found the GAD-7 to be reliable, and reported a Cronbach's alpha of .92, and a test-retest reliability of .83. A study conducted among Slovak college students reported a Cronbach's alpha of .89 (Hajduk et al., 2019). Henn and Morgan (2019) validated the GAD-7 in a non-clinical sample of employees in South Africa. They found a good model fit for a one-factor model and reported evidence of discriminant and convergent validity. They also reported a high Cronbach's alpha coefficient of .92. The present study found an omega composite reliability index of .89 for the unidimensional model.

***Social Functioning Questionnaire (SFQ;* Tyrer, Nur, Crawford, Karlsen, MacLean, Rao, & Johnson, 2005).** The SFQ is an eight-item self-report scale questionnaire measuring perceived social functioning (Tyrer et al., 2005). The SFQ is scored on a four-point Likert-type scale, ranging between 0 and 3, with varying response anchors. The questionnaire enquires about social functioning in the following life domains: work and home tasks, financial concerns, relationships with family, sexual activities, social contracts and leisure activities. Tyrer et al. (2005) designed the scale to have a higher score reflect poorer social functioning. In the present study, all items were reversed scored so that a higher score

would show better social functioning. Tyrer et al. (2005), who did not report internal consistency reliability, found good test-retest (r = .8) and inter-rater reliability (r = .7). A recent study conducted among Slovak college students yielded a Cronbach's alpha of .70 (Hajduk et al., 2019). The present study found an omega composite reliability index of .66 for the unidimensional model.

Research Procedure and Ethical Aspects

Ethical clearance for this study was provided by the Research Ethics Review Board of the University of the Free State (UFS-HSD2019/1941/2407). An online survey platform (EvaSys) was used. The Communication and Marketing Department at the University of the Free State distributed (via email) the link to the online survey to all full-time undergraduate students. All participants gave informed consent before participating in the online survey. Participants had to indicate on the online survey that they had read the provided information and consented to participating in the study. Informed consent included the objectives, importance and value of the study, the data collection procedure, ethical aspects of voluntary participation, anonymity as well as the safekeeping of information collected. A small incentive in the form of vouchers (a chance to win one of three R1000/USD70 vouchers) was offered to encourage participation. The incentive was considered on the basis of it being proportionate to the commitment expected of the participant, and not being so large as to lead participants to feel coerced to take part (Singer & Couper, 2008).

Details of the university mental health (counselling) services and the South African Anxiety and Depression Group (SADAG) were provided for students who may have experienced psychological distress as a result of research participation. Thus, the study was conducted in accordance with the ethical guidelines provided by the International Union of Psychological Science (2008), the South African Department of Health (2014, 2015) and the World Health Organization Helsinki Declaration (WHO, 2001).

Data Analysis

Statistical Package for Social Sciences (IBM-SPSS, version 25; see Field, 2018) and Mplus (version 8.1; Muthén & Muthén, 1998–2017) were used for statistical analysis. Preliminary statistics included descriptive statistics for the PHQ-9, GAD-7 and the SFQ. Thereafter, latent class analysis was conducted, followed by group comparison analysis using analysis of variance (ANOVA).

Measurement models, descriptive statistics and construct validity. The following measurement models were tested: a one-factor model with all items, a three-factor model distinguishing the measured constructs, the unidimensional PHQ-9 model, the unidimensional GAD-7 model, and the unidimensional SFQ model. Modification indices as recommended by Byrne (2012) were used when model improvement was necessary. Construct validity of the instruments were evaluated using confirmatory factor analysis (CFA) (Brown, 2006). The following indices and cut-off points for fit as recommended by Hu and Bentler (1999) were used: chi square (χ^2), standardised root mean residual (SRMR), root mean square error of approximation (RMSEA), Tucker-Lewis index (TLI), comparative fit index (CFI), Akaike's information criterion (AIC), and the Bayesian information criterion (BIC). It is expected that for good fit the following thresholds must be met: SRMR $\leq .08$, RMSEA $\leq .06$, TLI $\geq .95$, and CFI $\geq .95$ (Hu & Bentler, 1999). Generally, models with a lower AIC and BIC are considered to best fit the data (Brown, 2006). The robust estimator, MLR, was also used.

Latent class analysis. LCA is a model-based measurement in which individuals can be classified into mutually exclusive and exhaustive types, or latent classes, based on the way they respond to a set of categorical indicator variables (Awang, 2015; Rosato & Baer, 2012). Unique differences in observed item response patterns are understood by differences in latent class membership (Geiser, 2013). LCA can be used to test theories about typological

differences between individuals by assuming a specific number of classes as well as by setting parameter restrictions. The number of classes is then determined by means of fit criteria and model comparisons, based on the following model fit indexes: loglikelihood, AIC, BIC, sample size adjusted BIC (SSABIC), entropy, Lo-Mendell-Rubin likelihood ratio test (LMR-LRT), Vuong-Lo-Mendell Rubin likelihood ratio test (VLM-LRT) and the parametric bootstrap likelihood ratio test (PBLRT) (Rosato & Baer, 2012). For good fit, the AIC, BIC and the SSABIC are expected to be lower and the LMR-LRT and VLM-LRT are expected to be statistically significant (Geiser, 2013; Rosato & Baer, 2012).

Comparison across classes. The resultant classes were compared for social functioning, using analysis of variance (ANOVA). ANOVA was used to compare the means of more than two groups (Field, 2018). To compare group means, post hoc (multiple comparison) tests were performed. Equal variances were assumed and the post hoc test used was the Tukey method (most common for comparing all possible group parings) (Field, 2018). Lastly, a one-way ANOVA was conducted to explore the differences in social functioning across the latent classes.

Results

Preliminary and Descriptive Statistics

Item-level descriptive statistics for the PHQ-9, GAD-7 and the SFQ for the whole sample are reported in Table 2. All data had normal distributions. Skewness and kurtosis values show all the items scores to be within normal range. Skewness values for the PHQ-9 ranged between -0.69 (*SE* = 0.055) for PHQ-9 item 1 (anhedonia) and 0.950 (*SE* = 0.054) for PHQ-9 item 9 (suicidality), and for kurtosis between -1.429 (*SE* = 0.108) for PHQ-9 item 6 (guilt/worthlessness) and -0.614 (*SE* = 0.108) for PHQ-9 item 9 (suicidality). For the GAD-7, skewness values ranged between -0.598 (*SE* = 0.054) for GAD-7 item 3 (worrying too much) and 0.487 (*SE* = 0.054) for GAD-7 item 5 (restless) and for kurtosis between -1.381 (SE =

0.110) for GAD-7 item 7 (afraid/fear) and -0.879 (*SE* = 0.110) for GAD-7 item 3 (worrying too much). Skewness values for the SFQ ranged between -0.56 (*SE* = 0.055) for SFQ item 7 (lonely/isolated) and 1.505 (*SE* = 0.055) for SFQ item 8 (leisure activities) and for kurtosis between -1.155 (*SE* = 0.110) for SFQ item 4 (close relationships) and 1.623 (*SE* = 0.110) for SFQ item 8 (leisure activities). The highest endorsed item in the depression measure was PHQ-9 item 3 (sleep disturbance) (*M* = 1.96, *SD* = 1.090) and the lowest mean score was for PHQ-9 item 9 (suicidality) (*M* = 0.84, *SD* = 1.101). The variable that scored the highest mean score in the GAD-7 was GAD-7 item 3 (worrying too much) (*M* = 2.06, *SD* = 0.982), and the lowest mean score was GAD-7 item 5 (restless) (*M* = 1.10, *SD* = 1.054). The SFQ items indicative of social dysfunction were reversed scored so as to obtain a meaningful score, with a higher score showing better perceived social functioning. The variable that scored the highest mean score in the SFQ was SFQ item 3 ("I have no money problems") (*M* = 1.90, *SD* = 0.891), and the lowest mean score was SFQ item 8 ("I enjoy my spare time" (*M* = 0.51, *SD* = 0.775).

< Table 2 approximately here >

Measurement Models

The one-factor model, with all the items from the three measuring instruments, was ill fitting (CFI = .875; TLI = .863; RMSEA = 0.062, $p < .001$ [0.060 0.065]). The three-factor structure, with the theoretically intended distinction between PHQ-9, GAD-7 and SFQ, had a better fit, thus attesting to construct validity (CFI = .918; TLI = .909 RMSEA = 0.051, $p = .291$ [0.048 0.053]). As shown in Table 3, the individual measuring instruments for depression, anxiety and social functioning had good model fit, albeit with minor modifications. The original unidimensional PHQ-9 model had inadequate fit (CFI = .909; TLI = .878; RMSEA = 0.089, $p < .001$ [0.082 0.096]), and was improved to an acceptable fit when the residual errors of item 3 (sleep disturbance) and item 4 (fatigue) were correlated

(MI = 133.435; EPC = 0.210) (CFI = .936; TLI = .912; RMSEA = 0.076, $p < .001$ [0.068 0.083]). The original unidimensional GAD-7 model yielded good fit (CFI = .950; TLI = .926; RMSEA = 0.094, $p < .001$ [0.085 0.105]), with no modifications needed. The unidimensional model SFQ model did not fit the data so well (CFI = .916; TLI = .883; RMSEA = 0.059, $p = .041$ [0.050 0.068]). The model was then improved to be an acceptable fit (CFI = .951; TLI = .927; RMSEA = 0.046, $p = 0.753$ [0.038 0.056]) when the residual errors of item SFQ item 2 (find tasks stressful) and SFQ item 1 (completing tasks) were correlated (MI = 56.683; EPC = 0.125) and the residual errors of item SFQ item 7 (lonely/isolated) and SFQ item 4 (close relationships) were correlated (MI = 24.145; EPC = 0.139). The social functioning measurement model is displayed in Figure 1.

< Table 3 approximately here >

< Figure 1 approximately here >

Fit of the Latent Class Solution using Depression and Anxiety Symptoms

As displayed in Table 4, model fit criteria for LCA models specifying one, two, three, four and five classes indicated that the four-class model provided the best fit for the data (SSABIC = 72481; and significant LMR-LRT and VLM-LRT). From the LMR-LRT and VLM-LRT, it is clear that the five-class model was not significantly better than the four-class solution, thus providing a more parsimonious fit for the data. The more robust measures such as the LMR-LRT and VLM-LRT are more dependable (Nylund et al., 2007). The diagonal classification probabilities ranging between 0.901 and 0.943, as shown in Table 5, give a good indication of class membership.

< Table 4 approximately here >

< Table 5 approximately here >

Latent Class Models and Description of Classes

A schematic presentation of the typology for the four-class solution, which includes all the 16 items from the PHQ-9 and GAD-7, is presented in Figure 2. Class 1 (20.3%) is labelled "*Healthy*". The members of this class have the lowest rates of comorbid depression and anxiety symptom endorsement compared to all other classes. As shown in Table 6, the item mean scores for this class range between 0.13 (PHQ-9 item 8: psychomotor agitation) and 1.05 (PHQ-9 item 1: anhedonia).

Class 2 (35.3%) is labelled as "*Anxious exhaustion".* This class has the largest membership and has the second largest endorsement of depression and anxiety symptoms. It is characterised by high endorsement of sleep disturbance (PHQ-9 item 3), fatigue (PHQ-9 item 4), feeling on edge (GAD-7 item 1), uncontrollable worry (GAD-7 item 2), worrying too much (GAD-7 item 3), irritability (GAD-7 item 6), and fear (GAD-7 item 7).

Class 3 (18.3%) is labelled "*Anxious depression"* and has the least number of members. This class represents the most severely distressed class, with higher rates of symptom endorsement for almost all symptoms compared to the whole study. This group was found to endorse numerous indicators which include depressed mood (PHQ-9 item 2), sleep disturbance (PHQ-9 item 3), self-reproach (PHQ-9 item 6), concentration problems (PHQ-9 item 7), on edge (GAD-7 item 1), uncontrollable worry (GAD-7 item 2), worry too much (GAD-7 item 3), trouble relaxing (GAD-7 item 4), irritable (GAD-7 item 6) and fear (GAD-7 item 7). Scores ranged from 2.00 (PHQ-9 item 8: psychomotor agitation) to 2.95 (GAD-7 item 3: worrying too much).

Class 4 (26.1%) is labelled "*Low distress"* and is characterised by low levels of endorsement of sleep disturbance (PHQ-9 item 3), excessive worry (GAD-7 item 3) and irritability (GAD-7 item 6).

< Table 6 approximately here >

< Figure 2 approximately here >

Comparison of Social Functioning Across the Latent Classes

A one-way ANOVA was used to compare social functioning across the classes (see Table 7). A statistically significant difference across groups was found for the SFQ total, *F* (3.1951) = 348.037, $p < .001$. A robust test of equality of means was conducted for the SFQ total and the adjusted *F* statistics were found to be statistically significant; *F* (3.961, 585) 343, 084, $p < .001$; which indicated that at least one of the group means was significantly different from the other. Therefore, Tukey HSD post hoc follow-up tests were conducted.

A statistically significant difference was found between all classes. On average, Class 1 obtained a higher social functioning score (*M* = 17.18, *SD* = 3.29) than Class 2 (*M* = 12.60, *SD* = 3.33). The mean difference of 4.58 (SE = .21) was significant, $p < .001$, 95% CI [4.05, 5.11], η2 = 0.075. Class 1 obtained a higher social functioning score (*M* = 17.18, *SD* = 3.29) than Class 3 (*M* = 9.99, *SD* = 3.33). The mean difference of 7.19 (SE = .24) was significant, $p < .001$, 95% CI [6.57, 7.81], η2 = 0.118. On average, Class 1 obtained a higher social functioning score (*M* = 17.18, *SD* = 3.29) than Class 4 (*M* = 14.91, *SD* = 3.16). The mean difference of 2.27 (SE = .22) was significant, $p < .001$, 95% CI [1.70, 2.83], η2 = 0.037.

On average, Class 2 obtained a higher social functioning score (*M* = 12.60, *SD* = 3.33) than Class 3 (*M* = 9.99, *SD* = 3.33). The mean difference of 2.61 (*SE*= .21) was significant $p < .001$, 95% CI [2.06, 3.16], η2 = 0.043. On average, Class 2 obtained a significantly lower social functioning score (*M* = 12.60, *SD* = 3.33) than Class 4 (*M* = 14.91, *SD* = 3.16). The mean difference of -2.31 (SE = .19) was significant, $p < .001$, 95% CI [-2.80, -1.82], η2 = -0.038. Lastly, on average, Class 3 obtained a lower social functioning score (*M* = 9.99, *SD* = 3.33) than Class 4 (*M* = 14.91, *SD* = 3.16). The mean difference of -4.93 (SE = .23) was significant, $p < .001$, 95% CI [-5.51, -4.34], η2 = - 0.081.

< Table 7 approximately here >

< Table 8 approximately here >

Discussion

The aim of the study was to examine the role of depression and anxiety symptoms in the social functioning of university students by investigating how depression and anxiety symptom latent classes distinguish levels of social functioning. Thus, the study sought to answer two questions and respond to two objectives. First, how do naturally occurring latent classes of depression and anxiety symptoms present in a university student sample? Second, how do these unique classes distinguish levels of social functioning of university students? As expected, the results show that the most severely distressed classes, with higher levels of symptom endorsement for depressive and anxiety, are associated with lower social functioning. In other words, the higher the reports of depression and anxiety symptoms, the poorer the social functioning amongst university students. This finding resonates with Hajduk et al.'s (2019) study in which they found that the severity of depression and anxiety symptoms was correlated with poorer social functioning in a variety of domains.

The empirical evidence presented by the present study regarding the prevalence of depression and anxiety is a cause for concern. The total mean score for depression was indicative of a moderate severity (M = 13.29, SD = 6.369). This severity index is in accordance with the cut-off scores proposed by Kroenke et al. (2001), and as observed by Adewuya et al. (2006) in a group of Nigerian students and by Lun et al. (2018) among undergraduate students in Hong Kong. The sample also yielded a moderate level of anxiety severity (M = 11.56, SD = 5.739). This severity index was in accordance with the cut-off scores used by Lun et al. (2018) with undergraduate students in Hong Kong. These results indicate a similar trend in depression and anxiety prevalence in studies among university students.

Rousseau et al.'s (2021) study among university students in South Africa indicated that there was an increase in the prevalence and severity of depressive symptoms from 2016 to 2019. They found that there was an increase from minimal to mild depressive symptoms, with more students reporting moderate to severe depressive symptoms in 2018 and 2019 than previous years (Rousseau et al., 2021). A similar trend was found by Bantjes et al. (2016), with the majority of their sample presenting with minimal depression and anxiety symptoms and the rest of the sample presenting with moderate to severe depression (12.4%) and moderate to severe anxiety (15.8%). Comparison data from a recent South African study shows that in the past 12 months, 20.8% of first-year students had clinically significant problems with anxiety, and 13.6% had problems with depression. These mental health problems have a range of adverse effects including impaired social functioning, academic failure and suicide (Bantjes et al., 2019). Hajduk et al. (2019), in their sample of Slovakian university students (N = 1331), found that 35.5% of students experienced moderately severe depressive symptoms, and 25.5% experienced moderately severe anxiety symptoms.

Social functioning mean score for the group (M = 13.66, SD = 4.057) was indicative of poor social functioning. Class 3 had the poorest social functioning with M = 9.99, SD = 3.33, with the highest endorsement of comorbid depression and anxiety symptoms. Class 2 had the second lowest social functioning scores (M = 12.60, SD = 3.33) with the second highest levels of comorbid depression and anxiety symptoms. Class 1 had the highest social functioning scores (M = 17.18, SD = 3.29) with the lowest endorsement of comorbid depression and anxiety symptoms. The results of the current study reiterate Hajduk et al.'s (2019) findings, which showed that severity of anxiety and depression were related to the levels of social functioning.

Four clinically meaningful classes of comorbid depression and anxiety were identified in this non-clinical sample of students. Classes were given names that best represented them,

with symptom endorsement, severity and the presentation of specific variables being used to name and describe the classes. The first class was termed *"Healthy"* (20.3%), the second class was termed *"Anxious exhaustion"* (35.3%), Class 3 was labelled *"Anxious depression"* (18.3%), and the fourth class was named *"Low distress"* (26.1%). The latent classes of university students that were identified not only differed in frequency of symptoms, but also with respect to the types of symptoms that were endorsed. A distinction was found between psychological and somatic, depressive and anxiety symptoms. The symptoms that indicated emotional distress were classified as psychological symptoms and the physical symptoms associated with depression and anxiety were classified as somatic symptoms (Unick et al., 2009). This distinction between somatic and non-somatic symptoms was previously reported by Rudenstine and Espinosa (2018) and Unick et al. (2009).

From the four classes extracted by means of LCA, two major distinctions were made. Class 2 (*Anxious exhaustion*) and 3 (*Anxious depression)* represent the most severely distressed classes, with higher rates of symptom endorsement for almost all depression and anxiety symptoms, when compared to all other classes. Class 1 *(Healthy)* and 4 (*Low distress)* differ in severity but not in the type of symptoms that individuals presented with (Ferdinand et al., 2005; Unick et al., 2009). There are several meaningful differences between the classes. The most obvious is severity. Class 1 *(Healthy)* has very little indication of clinical distress, while Class 3 *(Anxious depression)* has rather severe clinical distress.

Class 2 *(Anxious exhaustion)* and Class 3 *(Anxious depression)* had high rates of endorsement for all studied symptoms. However, Class 2 *(Anxious exhaustion)* had more prominent psychological anxiety symptoms, while Class 3 *(Anxious depression)* members had prominent psychological depressive symptoms, and prominent psychological and somatic anxiety symptoms. The Anxious exhaustion class (35.3%) was the largest. These are individuals who endorse higher levels of psychological anxiety symptoms and limited

somatic depressive symptoms; sleep disturbance, fatigue, feeling on edge, uncontrollable worry, worrying too much, irritability and fear. Anxious exhaustion provides a good description for this group, as it has been found that arousal and fatigue are associated (Jacobson & Newman, 2014). For example, anxiety is associated with physiological activation which decreases energy levels and results in fatigue (Jacobson & Newman, 2014).

The class with the lowest number of participants, *Anxious depression* (Class 3), could arguably have experienced the most distress. These individuals endorsed the highest levels of somatic and psychological depressive and anxiety symptoms, characterised by depressed/low mood, sleep disturbance, self-reproach, concentration problems, feeling on edge, uncontrollable worry, worrying too much, trouble relaxing, irritability and fear. It is worth noting that "worry" was highest endorsed symptom, with uncontrollable worry and fear symptoms being highly endorsed in Class 2 *(anxious exhaustion)* and Class 3 *(anxious depression*) as well. Worrying is one of the most prominent predictors of deterioration in functioning in individuals with anxiety disorder and is significantly correlated with higher depressive symptoms (Newman et al., 2017).

In addition to the identified four latent classes, it was found that all four classes differentiate the levels of social functioning. In other words, severity of depression and anxiety was inversely related to the level of social functioning. This finding is similar to Hajduk et al. (2019), who found that the severity of depression and anxiety symptoms were indicative of poorer social functioning in various domains. The classes that endorsed lower levels of depressive and anxiety symptoms were found to have better social functioning, while the class with the higher rate of symptom endorsement had the most severe problems in social functioning. Analysis of particular symptom relations found that the presence of certain symptoms could be used as a predictor for poorer social functioning (Kalin, 2020). It

was found that the endorsement of worry, fear and depressive symptoms is found in classes where social functioning is less effective (Classes 2 and 3) (Newman et al., 2017).

Class 2 *(Anxious exhaustion)* and Class 3 *(Anxious depression)* were associated with lower levels of social functioning. It was previously found that the presence of significant anxiety symptoms generally predicted worse outcomes, and this has been well demonstrated for depression (Kalin, 2020). Similar to previous research on these joint symptoms and theories of comorbidity between anxiety and depression (Mennin et al., 2008; Newby et al., 2015), poor concentration owing to anxiety and depression, irritability, lack of energy, fatigue and decreased sleep as a result of anxiety and depression formed a unique profile in this population. Unlike Unick et al.,'s (2009) finding, restless was not highly endorsed in this population. Unick et al., (2009) found a unique depression–anxiety symptom profile; this depressed-anxiety endorsement was also found among members of Class 3 (*Anxious depression*).

Class 3 represents the most severely distressed class, with participants endorsing higher rates of most depressive symptoms and almost all anxiety symptoms. The manifestation of common symptoms, as well as the co-occurrence of these symptoms, provides an explanation for the symptom severity and consequently poorer social functioning found in Class 3. Class 2 *(Anxious exhaustion)* and Class 3 *(Anxious depression)* both share the propensity to "worry" as the highest endorsed indicator. Worrying and fear are known to lead to the use of avoidance as a coping mechanism in university students, as students tend to avoid class or studying when they find these activities anxiety provoking (Jacobson & Newman, 2014). Empirical evidence has shown that mild to severe anxiety symptoms are associated with a higher level of academic difficulty (Lun et al., 2018).

In conclusion, many empirical studies have focused on the prevalence of depression and anxiety (Bantjes et al., 2019), while research efforts to understand symptom presentation,

complexity and comorbidity are limited (Kircanski et al., 2017). The findings of this study confirm that comorbid depression and anxiety manifest in unique symptom profiles which have an impact on social functioning even at a subsyndromal level. Although depressive symptoms were found to be more prevalent in this university student population, it was the classes with the endorsement of higher levels of anxiety symptoms that were found to have poorer social functioning. Worry and fear, in addition to depression, may be important symptoms of anxiety, and key contributors to poor social functioning among students (Newman et al., 2017). Lastly, by including individuals with no diagnoses, as well as a non-clinical population, this study was able analyse comorbid depression and anxiety below their diagnostic cut-offs (Unick et al., 2009).

Limitations. First, although the sample size of 1988 (completed questionnaires) was large, the study was conducted at only one university in South Africa, making the study limited in its generalisability to other universities. Second, data were collected via an online survey platform. While the use of online surveys has its advantages, it also has its disadvantages (Nayak & Narayan, 2019; Van Mol, 2017). In order to complete the online survey/questionnaire, students needed internet access and a device (laptop/smartphone). However, as online surveys are becoming more prevalent among university students, there is also an increase in the likelihood of survey fatigue (Van Mol, 2017). Since the temporality of association is a strong criterion for causality, cross-sectional studies cannot prove causality, although they do help to generate causal hypotheses (Makhubela, 2021). It is agreed that there is an underlying universal experience of depression and anxiety, however Sweetland et al. (2014) assert that due to the emic cultural context, there is a need for local adaptation of instruments. According to Chen (2008), measuring instruments used should demonstrate their appropriateness in all cultural groups involved, therefore it is important to note that the cut-

off scores for these measuring instruments are based on scores proposed by the original authors

Implications and future directions. This study contributes to the literature on the nosology of comorbid depression and anxiety in university students in South Africa. The combination of depression and anxiety severely affects social functioning. Accordingly, the unique combination of symptoms requires tailored interventions that address the different levels of social functioning. Assessing core symptoms of comorbid anxiety and depression in individuals can both refine the present diagnosis and help predict the subsequent onset of the full-blown disorder in subclinical individuals (Zhiguo & Yiru, 2014). The findings offer student mental health services the data to design targeted short-term evidence-based interventions for depression and anxiety. Therapy that focuses explicitly on symptoms (identified in the current study) show that it is indeed possible to tailor-make interventions while simultaneously increasing the chances for treatment success (Hajduk et al., 2019)

Depression and anxiety symptoms have an adverse effect on social functioning even in a subclinical student population. Thus, the findings of this study indicate that mental illness is a cause for concern amongst university students. Not only does this have implications for psychological intervention for students, but it poses a challenge for diagnosis effects, as well as policies for mental health promotion at the institutional level. Results from this study indicate that there is an urgent need to examine current mental health policies at universities. In addition, there is a need for universities to implement a systematic and continuous method for monitoring the mental health of their students. Associated student mental health services seem to be an ideal way to help identify undergraduate students with mental health problems. Lastly, this study serves as empirical evidence for the need for education on mental health.

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Ethical Approval

Ethical approval for this study was provided by the review board of the University of the Free State, which granted the ethical clearance number: UFS-HSD2019/1941/2407.

Declaration of Competing Interest

Authors declare no conflict of interest

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Table 1

Demographic Profile of Participants

Variable	Category	Number (n)	Percentage (%)
Gender	Male	592	29.8
	Female	1374	69.1
	Non-binary	12	0.6
Race	Black	1675	84.3
	White	177	8.9
	Coloured	115	5.8
	Indian	14	0.7
	Asian	4	0.2
Home language	English	150	7.5
	Afrikaans	207	10.4
	Sesotho	476	23.9
	isiZulu	397	20.0
	isiXhosa	245	12.3
	Setswana	194	9.8
	Tshivenda	47	2.4
	Sepedi	111	5.6
	Xitsonga	54	2.7
	isiSwati	53	2.7
	isiNdebele	12	0.6
	Other	28	1.4
Marital status	Married	27	1.4
	Divorced	3	0.2
	Single	1925	96.8
	Widow/widower	1	0.1
	Cohabitating	29	1.5
Faculty	Economic and Management Sciences	344	17.3
	Educational	486	19.4
	Health Sciences	98	4.9
	Humanities	516	26.0
	Law	208	10.5
	Natural and Agricultural Science	404	20.3
	Theology and Religion	31	1.6
Year of study	First	724	36.4

Second	546	27.5
Third	454	22.8
Fourth	187	9.4
Fifth	64	3.2
Sixth	10	0.5

Table 2

Item-level Descriptive Statistics of the PHQ-9, GAD-7 and SFQ-items for the Whole Sample (N = 1988)

Patient Health Questionnaire – 9								
Variable	**Mean**	**(SD)**	**Min**	**Max**	**Kurtosis**	**(SE)**	**Skewness**	**(SE)**
PHQ-9 1: Anhedonia	1.66	(0.984)	0	3	-1.068	(0.110)	-0.69	(0.055)
PHQ-9 2: Low mood	1.63	(1.004)	0	3	-1.105	(0.110)	-0.057	(0.055)
PHQ-9 3: Sleep disturbance	1.96	(1.090)	0	3	-1.090	(0.110)	-0.547	(0.055)
PHQ-9 4: Fatigued	1.76	(0.982)	0	3	-1.022	(0.108)	-0.222	(0.055)
PHQ-9 5: Weigh disturbance	1.60	(1.136)	0	3	-1.386	(0.108)	-0.132	(0.055)
PHQ-9 6: Guilt/worthlessness	1.48	(1.150)	0	3	-1.429	(0.108)	0.031	(0.055)
PHQ-9 7: Impaired concentration	1.46	(1.087)	0	3	-1.281	(0.108)	0.067	(0.055)
PHQ-9 8: Psychomotor agitation	0.89	(1.016)	0	3	-0.650	(0.108)	0.780	(0.055)
PHQ-9 9: Suicidality	0.84	(1.101)	0	3	-0.614	(0.108)	0.950	(0.054)
PHQ9 Total	13.29	(6.369)	0	27	-0.810	(0.10)	0.038	(0.055)
Generalised Anxiety Disorder – 7								
Variable	**Mean**	**(SD)**	**Min**	**Max**	**Kurtosis**	**(SE)**	**Skewness**	**(SE)**
GAD-7 1: Anxious/on edge	1.67	(1.038)	0	3	-1.177	(0.110)	-0.133	(0.054)
GAD-7 2: Uncontrollable worry	1.81	(1.057)	0	3	-1.167	(0.110)	-0.327	(0.054)
GAD-7 3: Worrying too much	2.06	(0.982)	0	3	-0.879	(0.110)	-0.598	(0.054)
GAD-7 4: Trouble relaxing	1.56	(1.053)	0	3	-1.209	(0.110)	-0.023	(0.054)
GAD-7 5: Restless	1.10	(1.054)	0	3	-1.017	(0.110)	0.487	(0.054)
GAD-7 6: Irritable	1.72	(1.062)	0	3	-1.219	(0.110)	-0.206	(0.054)
GAD-7 7: Afraid/fear	1.63	(1.131)	0	3	-1.381	(0.110)	-0.136	(0.054)

GAD7 Total	11.56	(5.739)	0	21	-1.011	(0.110)	-0.157	(0.55)
Social Functioning Questionnaire								
Variable	**Mean**	**(SD)**	**Min**	**Max**	**Kurtosis**	**(SE)**	**Skewness**	**(SE)**
SFQ 1: Complete tasks	1.37	(0.868)	0	3	-0.883	(0.108)	-0.267	(0.055)
SFQ 2: Find tasks stressful	1.61	(0.920)	0	3	-0.963	(0.110)	0.176	(0.055)
SFQ 3: Financial difficulties	1.90	(0.891)	0	3	-1.022	(0.110)	-0.181	(0.055)
SFQ 4: Close relationships	1.55	(1.037)	0	3	-1.155	(0.110)	-0.074	(0.055)
SFQ 5: Intimacy	0.69	(0.994)	0	3	0.005	(0.110)	1.166	(0.055)
SFQ 6: Family relationships	1.07	(0.879)	0	3	-0.751	(0.110)	0.347	(0.055)
SFQ 7: Lonely/isolated	1.64	(0.971)	0	3	-1.014	(0.110)	-0.56	(0.055)
SFQ 8: Leisure activities	0.51	(0.775)	0	3	1.623	(0.110)	1.505	(0.055)
SFQ Total	13.66	(4.057)	0	23	-0.345	(0.111)	0.151	(0.055)

Note: PHQ-9 = Patient Health Questionnaire - 9; *GAD-7* = Generalised Anxiety Disorder – 7; *SFQ* = Social Functioning Questionnaire; *Mean* = Mean Statistic; *Kurtosis* = Kurtosis Statistic; *Skewness* = Skewness Statistic; *Min* = Minimum Statistic; *Max* = Maximum Statistic; *SD* = Standard Deviation Statistic; *SE* = Standard Error .

Table 3.

Measurement Models of the PHQ-9, GAD-7, and SFQ (N = 1988)

Model	χ^2	***df***	***p***	**RMSEA, *p* [90% CI]**	**CFI**	**TLI**	**SRMR**	**AIC**	**BIC**
One factor model	2167.580	252	<.001	0.062, <.001 [0.060 0.065]	.875	.863	0.042	118839	119240
Three factor model	1505.644	249	<.001	0.051, .291 [0.048 0.053]	.918	.909	0.035	118103	118521
PHQ-9 with 1 factor, M1	449.511	27	<.001	0.089 , <.0001 [0.082 0.096]	.909	.878	0.045	47991	48142
PHQ-9 with 1 factor, M2	321.342	26	<.001	0.076, < .001 [0.068 0.083]	.936	.912	0.039	47843	48000
GAD-7 1 factor	262.342	14	<.001	0.094, <.001 [0.085 0.105]	.950	.926	0.032	34335	34452
SFQ with 1 factor, M1	155.667	20	<.001	0.059, .041 [0.050 0.068]	.916	.883	0.035	39998	40132
SFQ with 1 factor, M2	98.610	19	<.001	0.046, .753 [0.038 0.056]	.951	.927	0.028	39941	40080

Note: χ^2 = Chi-square; *df* = degrees of freedom; *p* = probability estimate; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardised Root Mean Square Residual; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; PHQ-9 = Patient Health Questionnaire - 9; GAD-7 = General Anxiety Disorder – 7 Scale; SFQ = Social Functioning Questionnaire. M1 = Original model; PHQ-9 M2 = Improved model (covariance between item 3 and 4); PFQ M2 = Improved model (covariance between item 1 and 2, item 4 and 7)

Table 4

Latent Class Solution Model Fit Indices using the symptoms of Depression and Anxiety as Continuous Variables (N = 1988)

Model	Log likelihood	AIC	BIC	SSA BIC	Entropy	LMR-LRT *ρ*	VLM-LRT *ρ*	PB-LRT *ρ*	Percentage				
									Class 1	Class 2	Class 3	Class 4	Class 5
1 class	-42154	824405	84674	84521	.	.	.		100	.	.	.	.
2 classes	-37505	75204	75747	75439	.906	<.001	<.001	<.001	47.1	52.9	.	.	.
3 classes	-36216	72724	73541	73077	.883	<.001	<.001	<.001	31.4	41.8	26.8	.	.
4 classes	**-35809**	**72009**	**73100**	**72481**	**0.853**	**0.0005**	**0.0005**	**0.0005**	**20.3**	**35.3**	**18.3**	**26.1**	**.**
5 classes	-35507	71503	72868	72092	0.839	.0875	0.0866	0.0875	18.2	16.9	20.7	20.0	24.2

Note: AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; SSABIC = Sample Size Adjusted BIC; LMR-LRT = Lo-Mendell-Rubin Likelihood Ratio Test; VLM-LRT = Vuong-Lo-Mendell-Rubin Likelihood Ratio Test; PB-LRT = Parametric bootstrap likelihood ratio test

Table 5

Classification Probabilities for the Most Likely Latent Class Membership (Column) by Latent Class (Row)

	Class 1 (20.3%)	Class 2 (35.3%)	Class 3 (18.3%)	Class 4 (26.1%)
Class 1	**.943**	.003	.000	.054
Class 2	.001	**.914**	.034	.050
Class 3	.000	.086	**.914**	.000
Class 4	.036	.064	.000	**.901**

Table 6

Mean Scores for the PHQ-9, GAD-7, SFQ Items for the Four Latent Classes

Variable	Mean (SD)				*F-ratio*	*df*	*p*
	Class 1	Class 2	Class 3	Class 4			
PHQ9 1: Anhedonia	1.05 (.989)	1.90 (.880)	2.23 (.890)	1.43 (.843)	139.040	3	<.001
PHQ9 2: Depressed mood	0.65 (.773)	1.91 (.839)	2.70 (.493)	1.27 (.713)	557.086	3	<.001
PHQ9 3: Sleep disturbance	1.00 (1.039)	2.34 (.901)	2.75 (.535)	1.62 (.535)	307.574	3	<.001
PHQ9 4: Fatigued	0.91 (.871)	2.05 (.849)	2.55 (.641)	1.50 (.819)	306.467	3	<.001
PHQ9 5: Weight/appetite disturbance	0.69 (.980)	1.87 (1.039)	2.48 (.763)	1.34 (.993)	246.848	3	<.001
PHQ9 6: Guilt/worthlessness	0.40 (.749)	1.82 (1.039)	2.55 (.754)	1.11 (.882)	426.868	3	<.001
PHQ9 7: Impaired concentration	0.55 (.806)	1.73 (.969)	2.50 (.759)	1.10 (.854)	367.605	3	<.001
PHQ9 8: Psychomotor problems	0.13 (.374)	1.03 (.968)	2.00 (.970)	0.54 (.694)	379.332	3	<.001
PHQ9 9: Suicidality	0.14 (.510)	0.96 (1.048)	2.10 (1.084)	0.34 (.634)	395.193	3	<.001
GAD7 1: Anxious/on edge	0.52 (.697)	2.06 (.827)	2.76 (.472)	1.30 (.689)	749.216	3	<.001
GAD7 2: Uncontrollable worry	0.53 (.700)	2.33 (.761)	2.86 (.405)	1.39 (.643)	10009.830	3	<.001
GAD7 3: Worrying too much	0.94 (.852)	2.55 (.664)	2.95 (.213)	1.64 (.695)	797.801	3	<.001
GAD7 4: Trouble relaxing	0.37 (.620)	1.98 (.817)	2.69 (.530)	1.11 (.655)	875.737	3	<.001
GAD7 5: Afraid/fear	0.15(.467)	1.32 (.939)	2.36 (.738)	0.69 (.702)	596.027	3	<.001
GAD7 6: Restless	0.63 (.762)	2.05 (.909)	2.74 (.544)	1.41 (.810)	510.838	3	<.001
GAD7 7: Afraid/fear	0.50 (.772)	2.00 (1.006)	2.74 (.516)	1.23 (.835)	529.385	3	<.001

PHQ-9 = Patient Health Questionnaire - 9; GAD-7 = General Anxiety Disorder – 7 Scale; *Mean*= Mean Statistic; *SD*= Standard Deviation Statistic; *F-ratio*= F-statistic; *df* = degrees of freedom; *p* = probability estimate.

Table 7

Comparison of Social Functioning Across the classes

Variable	Mean (SD)				*F-ratio*	*df*	*p*
	Class 1	Class 2	Class 3	Class 4			
SFQ 1: Complete tasks	2.06 (.852)	1.49 (.820)	1.30 (.799)	1.70 (.849)	61.375	3	<.001
SFQ 2: Find tasks stressful	1.84 (.832)	1.24 (.894)	0.92 (.930)	1.56 (.810)	84.377	3	<.001
SFQ 3: Financial difficulties	1.44 (.892)	1.04 (.871)	0.67 (.788)	1.23 (.850)	56.617	3	<.001
SFQ 4: Close relationships	2.02 (1.001)	1.25 (.963)	0.90 (.900)	1.65 (.985)	101.792	3	<.001
SFQ 5: Intimacy	2.63 (.788)	2.24 (1.023)	1.88 (1.161)	2.46 (.846)	43.895	3	<.001
SFQ 6: Family relationships	2.32 (.860)	1.83 (.822)	1.47 (.866)	2.09 (.803)	75.470	3	<.001
SFQ 7: Lonely/isolated	2.14 (.837)	1.11 (.891)	0.63 (.737)	1.61 (.791)	247.518	3	<.001
SFQ 8: Leisure activities	2.72 (.576)	2.42 (.804)	2.18 (.973)	2.62 (.618)	39.525	3	<.001
SF Total	17.18 (3.288)	12.60 (3.330)	9.99 (3.328)	14.91 (3.159)	348.037	3	<.001

Note: SFQ = Social Functioning Questionnaire; *Mean* = Mean Statistic; *SD* = Standard Deviation Statistic; *F-ratio* = F-statistic; *df* = degrees of freedom; *p* = probability estimate.

Table 8

Social Functioning Compared Across Classes

				95% CI	
Compared pairs	Mean difference	(SE)	*p*	Lower	Upper
Class 1 v/s class 2	4.579	(.207)	<.001	4.05	5.11
Class 1 v/s class 3	7.192	(.240)	<.001	6.57	7.81
Class 1 v/s class 4	2.266	(.220)	<.001	1.70	2.83
Class 2 v/s class 3	2.613	(.214)	<.001	2.06	3.16
Class 2 v/s class 4	-2.313	(.191)	<.001	-2.80	-1.82
Class 3 v/s class 4	-4.925	(.227)	<.001	-5.51	-4.34

Note: SE = Standard Error; *p* = probability estimate; CI = Confidence Interval

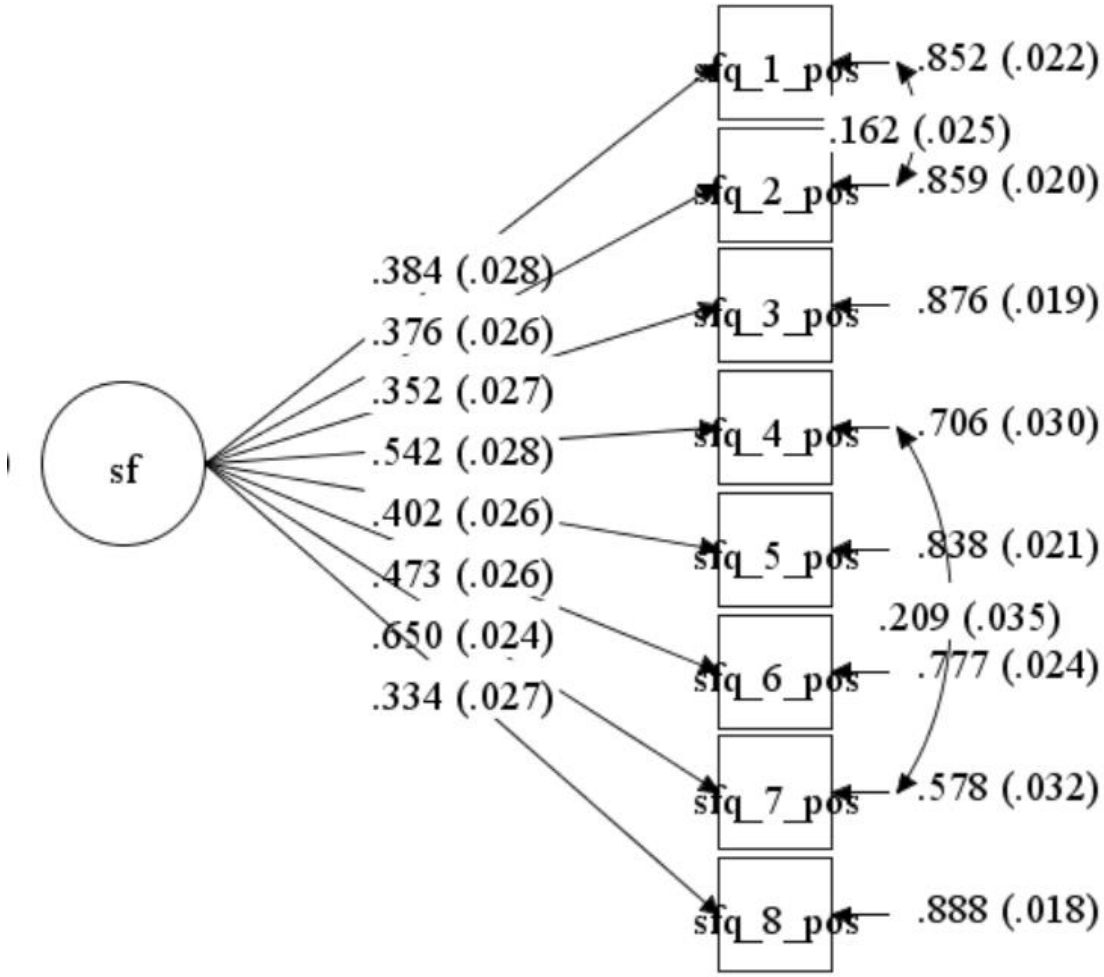

Figure 1. Social Functioning Measurement Model

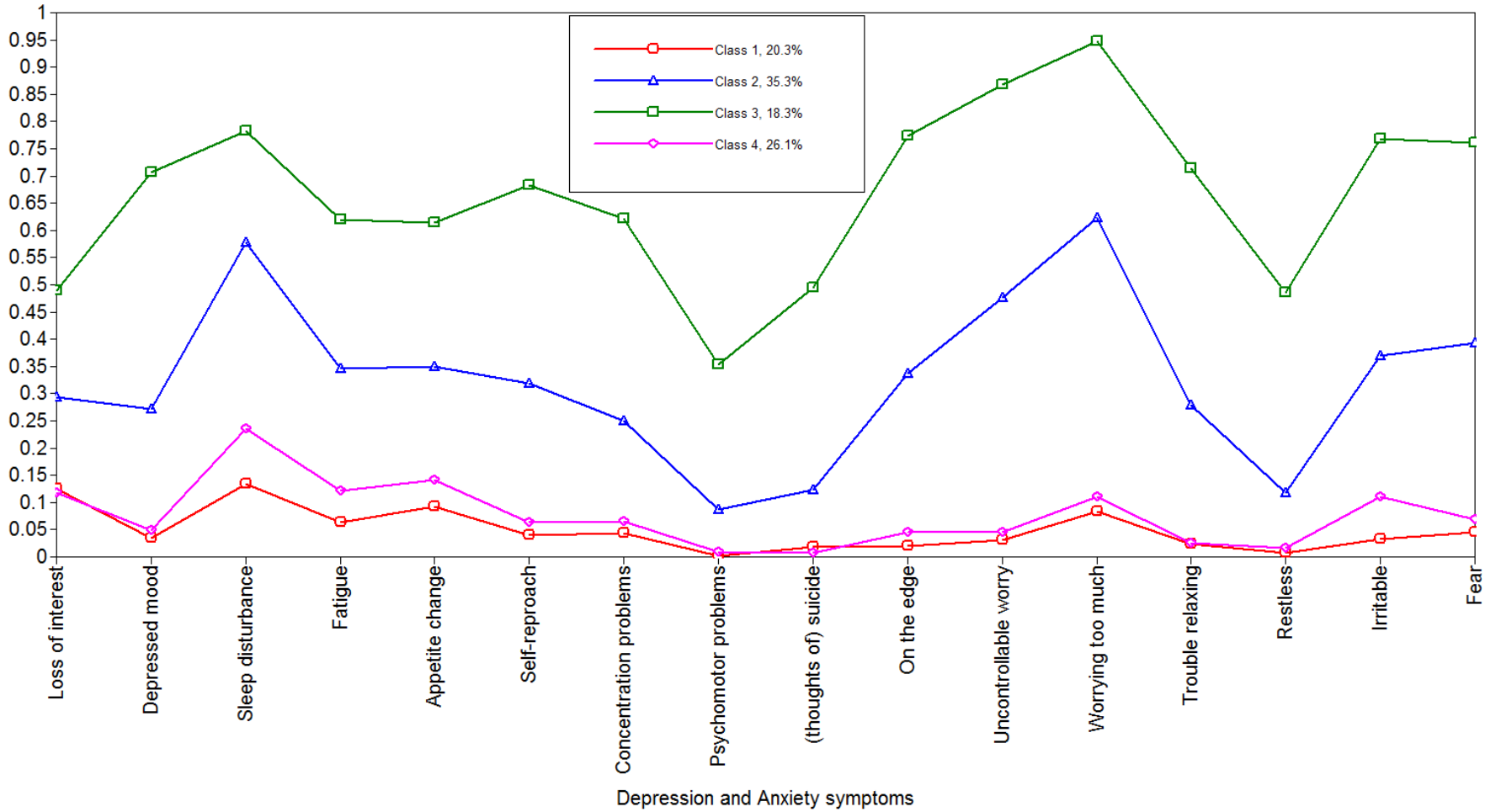

Figure 2. Latent Classes Profile

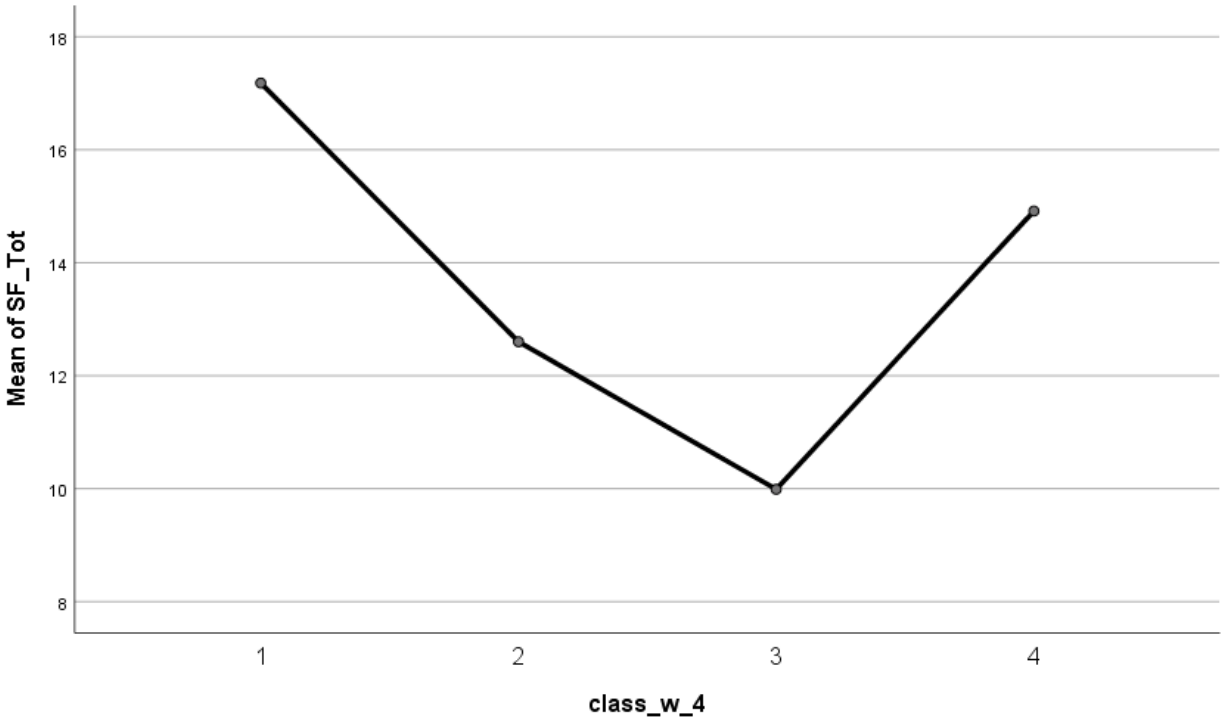

Figure 3. Total Mean Score of the SFQ for the Four Latent Classes

SECTION 3: CRITICAL SELF REFLECTION

This section of the mini-dissertation presents a personal critical reflection by the researcher who explores her overall experience of this study. The reflection includes the personal motivation behind the study, the experience of the data collection and analysis, as well as the unique population, sampling and setting. Particular emphasis is also placed on the conclusions derived from the findings, as well as their implication for science and practice. Therefore, in addition to the personal reflection, this section provides insight into the study's scientific and practice contribution to Psychology in general and student mental health in particular.

Critical Reflection

This mini-dissertation was completed as part of the requirements for the degree Master of Social Science in Clinical Psychology at the University of the Free State (Bloemfontein campus). As a future clinical psychologist, I am passionate and intrigued by clinical psychology research conducted in a South African context. Having completed my internship at Weskoppies Psychiatric Hospital, I have seen the importance of managing and treating mental illness among the South African population, including the student population at South African universities. Higher institutions of learning are required to create a space where mental health issues can be adequately addressed, and thus all universities provide mental health services for their students (Bowman & Payne, 2011). The question of whether university counselling services are adequately addressing the current mental health crisis among students remains unanswered. It is important to consider the South African student population, directing research specifically at our unique and diverse population. I have seen the impact that a lack of knowledge and understanding of mental health can have among students. Many students feel the need to conceal their struggles or, because they do not meet the diagnostic criteria, do not even know that they are struggling with mental health issues.

Even this subclinical presentation of symptoms below the diagnostic threshold causes a degree of impairment of students' (social) functioning.

Motivation and Development of the Study

As a first-generation university student from a traditional Indian background, the focus has always been on academic success. Like many South Africans, I come from a background where mental illness is often downplayed, misunderstood, stigmatised and overlooked. Prior to attending university, I was unaware of the prevalence of depression and anxiety and, moreover, how this could affect my peers. Throughout my university years, depression and anxiety were something you either "had" or did not have. I found that it was not a topic that was widely discussed, rarely would you find individuals who willingly disclosed their diagnosis. This left little room for a discussion on how my fellow students actually functioned or navigated these academic spaces while experiencing depression and anxiety symptoms. Furthermore, what did their functioning look like outside these academic spaces? Against this personal background, I became convinced of the personal and scientific need to explore the theme of depression and anxiety in a subclinical student population.

The present study examined the role played by depression and anxiety symptoms in the social functioning of university students. This aim was pursued by investigating how depression and anxiety symptom latent classes distinguish levels of social functioning. Therefore, the study sought to answer the research question of how naturally occurring latent classes of depression and anxiety symptoms distinguish the social functioning levels amongst university students? Based on the literature, it was expected that depressive and anxiety symptoms would yield heterogeneity of presentation across parsimonious latent classes (Rudenstine & Espinosa, 2018). Greater endorsement of depressive symptoms is more likely to co-occur with higher anxiety symptoms, with the inverse also being probable. It was

further hypothesised that the combination of depressive and anxious symptoms would be associated with greater impaired social functioning (Hajduk et al., 2019; Kalin, 2020).

While conducting this study, I was both fascinated and alarmed to learn how anxiety and depression present in a non-clinical student population. Two points were particularly noteworthy, namely, the exclusion of subclinical symptom presentation, and comorbidity between depression and anxiety. The examination of mental illness in both clinical and non-clinical settings has mainly focused on issues of diagnosis. The use of taxonomies to arrive at threshold and category-based diagnoses tends to dominate diagnostic practices (Dalgleish et al., 2020). The diagnostic threshold is applied as the rule for whether or not an individual can be diagnosed with depression or anxiety (Dalgleish et al., 2020). This practice gives little attention to individuals who may experience symptoms without meeting the diagnostic threshold (Dalgleish et al., 2020). The presentation of comorbid depression and anxiety is acknowledged in the literature but the impact is often studied separately (Kalin, 2020). The relationship between these two disorders are complex and somewhat idiosyncratic. What is known, however, is that comorbid depression and anxiety is prevalent and has deleterious consequences for those who present with depressive and anxiety symptoms (Kalin, 2020), even at a subclinical level (Unick et al., 2009).

As a response to the issues raised above, I endeavoured to move beyond the study of prevalence and severity and consider the naturally occurring latent classes derived from comorbid depression and anxiety symptoms. Furthermore, I examined the role played by comorbid depression and anxiety symptoms in the social functioning of students. Research shows that depression and anxiety symptoms (separately) affect specific domains of social functioning; accordingly, a focus of this study was to analyse the co-occurring impact of depression and anxiety.

Data Collection

The initial study was intended to take place face to face as well as online. However, this study ended up taking place during the Covid-19 global pandemic, which necessitated restrictions on social interactions and ways of teaching and working. Not without difficulty, the online platform was nevertheless beneficial for my study, as it proved to be a more efficient platform, allowing for the collection of a large amount of data within a short period of time. By collaborating with key role players at the University of the Free State, I was able to make use of a well-established online survey platform (Evasys). The Communication and Marketing Department at the University of the Free State distributed the link (via email) to the online survey to all full-time undergraduate students. This allowed me to reach my desired sample size in a timely manner.

Data Analysis and Interpretation

A quantitative survey design was selected based on the exploratory nature of the research question (Creswell, 2014). There are many advantages to the statistical method used (LCA), which are further emphasised throughout my study: there are numerous rigorous statistical tests to assess model fit; the ability to consult formal criteria to make decisions about the appropriate number of classes; latent class clustering can include observed variables of different scaling and measurement levels; and classification errors can be taken into account, calculated and reported (Karnowski, 2017). Individuals are often classified into groups according to specific mental health disorders or by exceeding a cut-off point as defined by the DSM-5. The fact that heterogeneity between subgroups can be substantial, as methods result in artificial, indistinct subgroups and any associations between them and other factors will be attenuated and the complexity ignored, is negated (Marquand et al., 2016; Unick et al., 2009). Many researchers have looked for a way to solve these methodological shortcomings. Firstly, the use of categorical diagnostic constructs can result in the loss of

valuable information about comorbidity (Ferdinand et al., 2005) (which this study was heavily focused on), because those who score just below the diagnostic threshold are often disregarded, not seen as a clinical population (Unick et al., 2009). Furthermore , the common, dimensional approach cannot be used to divide individuals into homogeneous subgroups. LCA allowed me to go beyond the dichotomous or dimensional nature of the data (Ferdinand et al., 2005) in order to compare social functioning across the uniquely extracted subgroups.

I expected to find three standard groups, similar to the classes outlined in literature. The first class/group expected was a healthy group, the second class/group was expected to have a higher levels of anxiety and the third class/group would have higher levels of depressive symptoms. However, four distinct groups were identified; a large low endorsement of symptom class, a small high symptom endorsement class, and two other classes which represented specific symptom types. The naming of the classes is the researcher's unique contribution to the body of knowledge, and was the most difficult step in my interpretation process. Accurately describing the classes was clouded with subjectivity, and was only possible after reviewing relevant literature multiple times as well as consulting my supervisors. In the end, I used symptom endorsement, severity and variable to name and describe the classes (Rudenstine & Espinosa, 2018; Unick et al., 2009). Variables (symptoms) were used to describe additional features of latent classes (Unick et al., 2009). The analysis continued by using an ANOVA to determine the level of social functioning for each class. It was fascinating to learn that individuals could still function adequately even while experiencing depressive and anxiety symptoms. Further investigation is therefore needed regarding "functional" depression and anxiety.

Findings

From the findings of the study, I arrived at the conclusion that comorbid depression and anxiety manifest in unique symptom profiles, which have an impact on social functioning

even at a subsyndromal level. First, symptom endorsement for all classes was found. Second, four clinically meaningful classes of depression and anxiety were extracted and the severity of depression and anxiety was related to the level of social functioning for each class. Therefore, classes that endorsed lower levels of depressive and anxiety symptoms were found to have better social functioning, while the class with the higher rate of symptom endorsement had the most severe problems in social functioning. Lastly, exploration of particular symptom relations found that the presence of certain symptoms could be used as a predictor for poorer social functioning. What was surprising was that even though depressive symptoms were found to be more prevalent in this university student population, it was the classes with the endorsement of higher levels of anxiety symptoms that were found to have poorer social functioning.

Main Contributions

This study makes several contributions to the literature. First, this study adds to the relatively small amount of comorbid depression and anxiety research conducted among South African university students. Findings from this study provides a platform for mental health problems and mental wellbeing in South Africa. Second, unlike most studies done on comorbid depression and anxiety, this study did not study depression and anxiety separately. Comorbid depression and anxiety have a significant impact on treatment and as previously mentioned, the co-occurrence of these two disorders generally predict worse outcomes than being diagnosed with just one disorder (Kalin, 2020). Third, the results of this study help provide a better understanding of the impact of severity and symptom endorsement on social functioning. Fourth, unique classes move past the “one-size-fits-all” diagnostic threshold and accounts for the subclinical population. Furthermore, this study reveals that specific symptoms may have a greater impact on an individual’s functioning, adding value to symptom-based analysis as well as treatment (Unick et al., 2009; Fried & Nesse, 2015).

Threshold scores are used to classify individuals as healthy or "ill". Therefore, looking at specific symptoms allowed me to look at how depressive and anxiety symptoms differentially impact students' social functioning.

Implications and Future Considerations

Comorbid depression and anxiety has a greater impact on social functioning than a single diagnosis or presentation of symptoms from on disorder (Kalin, 2020). Understanding how social functioning domains are affected could inform treatment and management. It is evident that comorbid depression and anxiety presents in a non-clinical student population as well as a subclinical population. Therefore, student mental health services need to extend their resources beyond students who are formally diagnosed with a disorder. This study moves away from using just threshold scores to classify individuals as healthy or "ill". Furthermore, it recognises that functioning can be impaired even at a subclinical level and advocates for recognition, treatment and management of mental health problems at this level. This study advocates for the way in which higher education institutions should approach mental health, campaigning for policies, programmes and treatment to address unmet mental health needs.

There is an urgent need to look at current mental health policies at universities (Kaminer & Shabalala, 2019). I believe that we can go further than this and, like the University of Cape Town, the University of the Free State could create a student mental health task team that is unique and is informed by all key groups at the university. Key issues to address would be the increasing prevalence and complexity of student mental health difficulties; the ability of university mental health service providers to keep up with the need for counselling services; an institutional culture of silence about mental health issues; creating a space to discuss mental illness; and increasing help-seeking behaviour (Kaminer & Shabalala, 2019). This study, along with others, shows that mental health problems are

prevalent amount university students. A treatment gap for the subclinical population exists, and the university plays an integral role in closing this gap (Auerbach et al., 2018).

Throughout this chapter I have emphasised the importance of cultural context (Lolas Stepke, 2015), as well as conducting research in South Africa (Pillay, 2019). This study calls for a paradigm shift to better address mental health problems among university students in South Africa by taking a closer look at the complexity of psychological disorders and the often inevitable clinical implications. Future research could go further by looking at culturally based factors associated with higher endorsed symptoms and social functioning.

The results of the study brought up several questions that I think would be important to address in future studies. Although not a prevalence study, I see the value of a continued analysis of the prevalence and severity of depression and anxiety among university students. Prevalence studies are used to inform researchers and guide developers and policymakers about burden of disease (Nsereko et al., 2014). The understanding of the burden of disease (through empirical evidence) helps university mental health care services identify and prioritise mental wellbeing, as well as in terms of prevention and policy (Nsereko et al., 2014). Covid-19 was a spanner in the works and should be a forethought when considering the prevalence and severity of depression and anxiety symptom endorsement by the participants of this study. Although not the focus of this study, it is possible that the sharp rise in the numbers was partially due to Covid-19 and the lockdown.

Personal Growth and Awareness

Supervision was critical owing to the complexity of the study. The one word I think of when viewing the supervision process is “scaffolding”. The global pandemic made it difficult to meet for face-to-face supervision, and communication was predominantly electronic and online. This required flexibility on my part, as well as on the part of my supervisor and my co-supervisor.

As mentioned above, this complex process included LCA. LCA is a person-centred approach, which seemed fitting, given the unique population as well as the heterogenous nature of depression and anxiety. Although difficult to understand at first, supervision and many hours of research brought to light the value of using LCA in this specific study. With the guidance of my supervisors I immersed myself in the LCA literature, understanding the advantages and disadvantages.

This study re-emphasised the vulnerability of the population that I myself still form part of. Stringent ethical guidelines were followed due to the nature of the population and the circumstances (Covid-19) that the study was conducted in. I was constantly adapting my study to adhere to all ethical guidelines. Through this rigorous process I learnt the importance of considering mitigating circumstances and making sure that all aspects of my procedure were based in evidence.

Throughout the research journey I have pondered on the contribution to the scientific community, struggling to balance over-emphasising the value and undervaluing the contribution that my study could make. After the writing of my discussion section I was forced to face reality. What does my study actually say about the mental health of my fellow students? The results of my study left me with the following questions. How many students struggle but are unsure about whether they are experiencing/suffering from depression and anxiety? How many students go unnoticed and untreated because they fall below the diagnostic threshold? Are our mental health services equipped to handle this crisis and, furthermore, are they held accountable for providing adequate services for the student population?

This process has emphasised the importance of research: to create a conversation, to shed light, and to ask the pertinent questions, all with the support of the much-valued empirical evidence (Lolas Stepke, 2015). Here are some of the difficult lessons I, as a future

clinical psychologist, have learnt throughout this process: (1) research is a critical tool needed to navigate my clients' complex world; (2) evidence is needed to support my claims (everyone has ideas, validation is what contributes to science); (3) we need to balance our inevitable subjectivity with objectivity; (4) cultural context, cultural considerations and cultural competency are important factors to keep in mind; and lastly, (5) my role as a South African researcher/future psychologist (Lolas Stepke, 2015). As a researcher, I am obligated to contribute not only to the body of scientific knowledge, but also to the real world.

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ADDENDUM

Addendum A: Demographic Questions and Questionnaires

*Numbers will be allocated randomly

Demographics

1. **Gender**

1	Male	
2	Female	
3	Non-binary	

2. **Age**

……

3. **Race**

	Category	Tick
1	Black	
2	White	
3	Coloured	
4	Indian	
5	Asian	

4. **Home language**

	Language	Tick
1	English	
2	Afrikaans	
3	Southern Sotho	
4	Zulu	
5	Xhosa	

6	Tswana	
7	Venda	
8	Northern Sotho	
9	Tsonga	
10	Swati	
11	Ndebele	
12	Other	Specify:

5. Marital status

	Status	Tick
1	Married	
2	Divorced	
3	Single	
4	Widow/widower	
5	Cohabitating	

6. Faculty

	Faculty name	Tick
1	Economic and Management Sciences	
2	Education	
3	Health Sciences	
4	The Humanities	
5	Law	
6	Natural and Agricultural Science	
7	Theology and Religion	

7. Programme/programme description (for example: BA majoring in History and English)

…….

8. Year of study

	Year of study	Tick
1	First	
2	Second	
3	Third	
4	Fourth	
5	Fifth	
6	Sixth	

PHQ-9 (*Kroenke, Spitzer & Williams, 2001*)

	How often during the past 2 weeks were you bothered by.....? (use "x" to indicate your answer)	**Not at all**	**Several days**	**More than half days**	**Nearly every day**
1.	Little interest or pleasure in doing things	**0**	**1**	**2**	**3**
2.	Feeling down, depressed, or hopeless	**0**	**1**	**2**	**3**
3.	Trouble falling or staying asleep, or sleeping too much	**0**	**1**	**2**	**3**
4.	Feeling tired or having little energy	**0**	**1**	**2**	**3**
5.	Poor appetite or overeating	**0**	**1**	**2**	**3**
6.	Feeling bad about yourself, or that you are a failure, or have let yourself or family down	**0**	**1**	**2**	**3**
7.	Trouble concentrating on things, such as reading the newspaper or watching television	**0**	**1**	**2**	**3**
8.	Moving or speaking so slowly that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot than usual	**0**	**1**	**2**	**3**
9.	Thoughts that you would be better off dead, or of hurting yourself in some way	**0**	**1**	**2**	**3**

GAD-7 (Spitzer, Kroenke, Williams, & Löwe, 2006)

	Over the last two weeks, how often have you been bothered by the following problems? (use "x" to indicate your answer)	**Not at all**	**Several days**	**More than half days**	**Nearly every day**
1.	Feeling nervous, anxious or on edge	**0**	**1**	**2**	**3**
2.	Not being able to stop or control worrying	**0**	**1**	**2**	**3**
3.	Worrying too much about different things	**0**	**1**	**2**	**3**
4.	Trouble relaxing	**0**	**1**	**2**	**3**
5.	Being so restless that it is hard to sit still	**0**	**1**	**2**	**3**
6.	Becoming easily annoyed or irritable	**0**	**1**	**2**	**3**
7.	Feeling afraid as if something awful might happen	**0**	**1**	**2**	**3**

SFQ (Tyrer, Nur, Crawford, Karlsen, MacLean, Rao, & Johnson, 2005)

Please look at the statements below and tick the reply that comes closest to how you have been recently.				
1. I complete my tasks at work and home satisfactorily	Most of the time	Quite often	Sometimes	Not at all
	0	1	2	3
2. I find my tasks at work and at home very stressful	Most of the time	Quite often	Sometimes	Not at all
	3	2	1	0
3. I have no money problems	No problems at all	Slight worries only	Definite problems	Very severe problems
	0	1	2	3
4. I have difficulties in getting and keeping close relationships	Severe difficulties	Some problems	Occasional problems	No problems at all
	3	2	1	0
5. I have problems in my sex life	Severe problems	Moderate problems	Occasional problems	No problems at all
	3	2	1	0
6. I get on well with my family and other relatives	Yes, definitely	Yes, usually	No, some problems	No, severe problems
	0	1	2	3
7. I feel lonely and isolated from other people	Almost all the time	Much of the time	Not usually	Not at all
	3	2	1	0
8. I enjoy my spare time	Very much	Sometimes	Not often	Not at all
	0	1	2	3

Addendum B: Information leaflet and Informed Consent form

The title of the research was changed after data was collected. The title was amended with Ethical clearance committee and the amendment was approved. The change of the title did not change the data collection method. The demographic questions are the questionnaires used.

RESEARCH STUDY INFORMATION LEAFLET AND CONSENT FORM

DATE

September 2020

TITLE OF THE RESEARCH PROJECT

A Person-centred Study of Anxiety and Depressive Symptoms Amongst University Students: Social Functioning and Gender Differences

PRINCIPAL INVESTIGATOR/RESEARCHER NAME(S) AND CONTACT NUMBER(S):

Kaylene Pillay *2012049181* *084 928 0279*

FACULTY AND DEPARTMENT:

Faculty of Humanities

Department of Psychology

STUDY LEADER(S) NAME AND CONTACT NUMBER:

Prof. I.P. Khumalo *KhumaloIP@ufs.ac.za* *051 401 9682*

Dr N.F. Tadi *Tadinf@ufs.ac.za* *051 401 9313*

WHAT IS THE AIM / PURPOSE OF THE STUDY?

The proposed study seeks to understand how anxiety and depressive symptoms present in a student population. It also focuses on how this presentation affects students' social functioning across genders. The findings of this study may, firstly, contribute towards current knowledge on how anxiety and depression are classified and, secondly, how anxiety and depression present in student populations.

WHO PERFORMS THE RESEARCH?

My name is Kaylene Pillay. I am currently a master's student in Clinical Psychology. I am conducting my research on the presentation patterns of anxiety and depressive symptoms, and how these affect student social functioning amongst undergraduate students at the University of the Free State. In addition to obtaining my master's degree, the data collected in this study will be used for publication in a scientific journal and for conference presentations.

HAS THE STUDY RECEIVED ETHICAL APPROVAL?

Yes. The ethical clearance number is: UFS-HSD2019/1941/2407

WHY ARE YOU INVITED TO TAKE PART IN THIS RESEARCH PROJECT?

You are invited to take part in this study because you are a registered undergraduate student at the University of the Free State. As university students are the specific target population for the study, you and your peers are the most appropriate people to approach. You will receive a set of questionnaires via email. These should be completed on EvaSys. You are requested to decide and indicate whether you are available to participate in this research project. You will be one of approximately 900 students from the University of the Free State to participate in this study.

WHAT IS THE NATURE OF PARTICIPATION IN THIS STUDY?

The study uses a set of questionnaires to gauge the symptoms of depression and anxiety, as well as indicators of social functioning. The battery of questionnaires consists of 28 items, and should take you approximately 20–30 minutes to complete.

CAN THE PARTICIPANT WITHDRAW FROM THE STUDY?

Your participation in this study is voluntary and there is no penalty or loss of benefit for non-participation. If you decide to participate, you will receive this information sheet to which you can refer. You will also be asked to provide informed consent. Consenting will involve making a mark in the demarcated area. Take note that this study involves the submission of non-identifiable questionnaires, thus making it impossible to withdraw your participation once your questionnaires have been submitted. However, you may withdraw at any time before the final submission of your questionnaire.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

The information you share with me in the questionnaires may benefit you personally, as it may provide you with a better understanding of anxiety and depressive symptoms, as well as levels of social functioning. If you require feedback on the findings of the study, please contact me for a copy of the report. However, because of the anonymous nature of participation, it will not be possible to provide individualised feedback. The findings of this study will contribute towards current knowledge regarding the classification of anxiety and depression, how these present, and how it affects social functioning across gender in university student populations.

WHAT IS THE ANTICIPATED INCONVENIENCE OF TAKING PART IN THIS STUDY?

You will need 20–30 minutes to complete the questionnaires. You are, therefore, sacrificing your personal time – we are grateful for sharing it. Because the questions in the questionnaires refer to symptoms of anxiety and depression, it is possible that this may carry the minimal risk of eliciting some degree of psychological distress. Should this occur, you are

advised to contact Dr Melissa Barnaschone at UFS Student Counselling and Development (051 401 2853).

KOVSIE counselling is on standby to provide psychological services. Should any student need telepsychology services from the University of the Free State, Student Counselling and Development can be contacted by calling 051 401 2853 (Bloemfontein) or by sending an email to SCD@ufs.ac.za

/ SCDQQ@ufs.ac.za / SCDSouth@ufs.ac.za

Telephonic assistance may also be sought from SADAG (The South African Depression and Anxiety Group). A counsellor may be contacted between 8 a.m. and 8 p.m., Monday – Sunday, at 011 234 4837. Participants can also call the 24-hour helpline at 0800 456 789.

Your participation in this study is appreciated.

WILL WHAT I SAY BE KEPT CONFIDENTIAL?

Protecting all participants from potential harm is our priority. Data collected, which will only be available to me and two supervisors, will be treated anonymously, and its use will be restricted to this study.

HOW WILL THE INFORMATION BE STORED AND ULTIMATELY DESTROYED?

All data from this study will be gathered in electronic form, and will be stored on a password-protected computer. Any future use will be restricted to the current ethics clearance, and the data will not be used for anything outside of the intended purpose of the study. After this time period, the data will be destroyed to prevent access by unauthorised individuals.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

A small incentive is available for participating in the study. Three students will each have the opportunity to win a voucher worth R1000. In order to stand a chance of winning the voucher, you need only complete the questionnaires pertaining to the study. Upon completion of the questionnaire, you will be asked whether or not you would like the opportunity to stand a chance to win one of three vouchers. If you agree, you will be asked to provide us with your contact details. Your contact details will be part of the raffle and a winner will be chosen at random and contacted using the contact details provided.

HOW WILL THE PARTICIPANT BE INFORMED OF THE FINDINGS / RESULTS OF THE STUDY?

If you would like to be informed of the final research findings, please contact Kaylene Pillay at kaylene1104@gmail.com. The final findings will be accessible upon request. Should you have concerns about the way in which the research has been conducted, you may contact the administrator of the Faculty of Humanities Research Ethics Committee, Mrs Charne Vercueil, on vercuilcc@ufs.ac.za, or at (051) 4017093.

Thank you for taking time to read this information sheet and for participating in this study.

CONSENT FOR PARTICIPATION IN THIS STUDY

I hereby volunteer to participate in a Psychology Masters study conducted by Kaylene Pillay from the University of the Free State. I understand that this study is designed to gather information on depressive and anxiety symptoms that may be present amongst University Students and how social functioning is impacted across gender.

I have read (or had explained to me) and understood the study as explained in the information sheet. I understand that my participation is voluntary and that I am free to withdraw while completing the questionnaire / survey. I am aware that I cannot withdraw my questionnaire / survey after submission. I am also aware that the findings of this study will be anonymously processed into a research report, journal publications, and/or conference proceedings.

I am aware that there is an incentive, and, if I wish to stand a chance to win a voucher, I will have to provide my contact details (this will allow the researcher to put my contact details in the raffle and contact me if I have won one of the vouchers).

I consent to participating in the above-mentioned research study (mark with an X / yes).

☐

Date: _____

Full Name(s) of Researcher(s): Kaylene Pillay

Addendum C: Ethic Clearance Certificate

UNIVERSITY OF THE FREE STATE
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YUNIVESITHI YA FREISTATA
UFS UV

GENERAL/HUMAN RESEARCH ETHICS COMMITTEE (GHREC)

19-Jan-2021

Dear Ms Pillay, Kaylene K

Ethics Committee feedback

Research Project Title:
The influence of anxiety and depressive symptoms on social functioning: A person-centred study among South
African university students

With reference to your application for ethical clearance for your research: Find attached the letter and decision from the GHREC meeting.

If you need to do modifications or respond to conditional approval:

Click HERE to open the manual

Ethics Admin

205 Nelson Mandela Drive
Park West
Bloemfontein 9301
South Africa

P.O. Box 339
Bloemfontein 9300
Tel: 051 401 9398 / 7619 / 3682
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YUNIVESITHI YA FREISTATA
UFS UV

GENERAL/HUMAN RESEARCH ETHICS COMMITTEE (GHREC)

28-Oct-2020

Dear Ms Pillay, Kaylene K

Amendment Approved

Research Project Title:
The influence of anxiety and depressive symptoms on social functioning: A person-centred study among South African university students

Ethical Clearance number:
UFS-HSD2019/1941/2407

We are pleased to inform you that your amendment application for ethical clearance has been approved. Your ethical clearance is valid for twelve (12) months from the date of issue. you are requested to submit the final report of your study/research project to the ethics office. Should you require more time to complete this research, please apply for an extension. Thank you for notifying the ethics committee of the changes/amendments that have been made to your study; we wish you the best of luck and success with your research.

Yours sincerely

Dr Adri Du Plessis
Chairperson: General/Human Research Ethics Committee

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Addendum D: Proof of Language Editing

Alexa Barnby

Language Specialist

Editing, copywriting, indexing, formatting, translation

BA Hons Translation Studies; APEd (SATI) Accredited Professional Text Editor, SATI

Mobile: 071 872 1334

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alexabarnby@gmail.com

17 May 2021

To whom it may concern

This is to certify that I, Alexa Kirsten Barnby, an English editor accredited by the South African Translators' Institute, have edited the master's mini-dissertation titled "The influence of anxiety and depressive symptoms on social functioning: A person-centred study among South African university students" by Kaylene Pillay.

The onus is on the author, however, to make the changes and address the comments made.