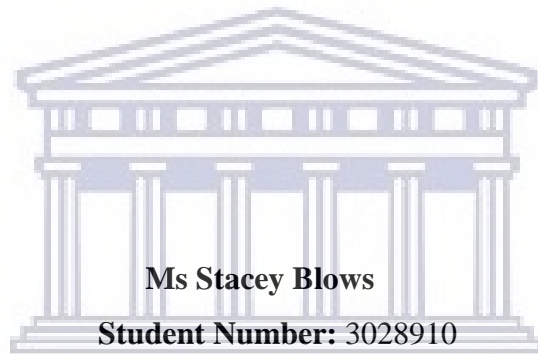


**FACTORS ASSOCIATED WITH SUBSTANCE USE AMONG UNIVERSITY  
STUDENTS IN SOUTH AFRICA: IMPLICATIONS FOR PREVENTION**

A mini-thesis submitted in partial fulfilment of the requirements for the MA Research  
Psychology degree in the Department of Psychology, Faculty of Community and Health  
Sciences, University of the Western Cape



**Ms Stacey Blows**

**Student Number: 3028910**

**UNIVERSITY of the  
WESTERN CAPE**

**Supervisor: Dr Serena Isaacs**

**Date: 31 August 2020**

## Abstract

Substance use and abuse has been a persistent challenge facing many communities around the world. In more recent times there has been particular focus on the gradual, yet alarming increase in the use and/or abuse of substance use among the students who are currently enrolled in institutions of higher learning. On the strength of such findings, relevant stakeholders and policy makers have since demarcated university students as being one of the most high-risk groups within a society when it comes to substance use and abuse. While substantial research has been done on the issue of alcohol use among adolescents on both a local and global scale, very little is known about the prevalence of substance use among university students in South Africa. In response to such a paucity in research, the overall aim of this research undertaking was to establish the prevalence and factors associated with substance use among university students in the Western Cape, South Africa.

The study employed a quantitative methodological approach, in which probability sampling was used to recruit participants 18 years and older from the respective university's student population. The study made use of self-administered questionnaires, sent to participants via SurveyMonkey. A total number of 2915 of students participated in the study (11.6%). The majority of participants fell in the two youngest categories listed, i.e. 18-24 years (63.9 %), and 25-34-year-old category (17%) respectively. Descriptive statistics was used to describe and provide the prevalence and overview of the demographic characteristics of the respondents. Associations between variables were explored using Chi-square and Mann-Whitney U tests. Bronfenbrenner's Ecological Systems Theory was used as a conceptual framework to guide the study.

The main findings revealed a substance use prevalence rate of 62.7%. Alcohol (80.6%), cannabis (46%), and ecstasy (5.3%) were found to be the three most prominent substances used. This study also revealed clear associations between students' substance use and mental health. Interestingly, other well documented factors such as age, gender, and environment were not associated with student substance use. Overall, the results support the promotion of contextualised awareness, prevention and intervention initiatives for university students in South Africa. However, in order to inform more effective primary prevention approaches, the extent to which the different factors are defining features and characteristics of substance use among university students, should be subject to further investigation.

**Keywords:** substance use, substance abuse, university, college, young adults, prevalence, quantitative methodology, ecological systems theory

### **Declaration**

I, Ms Stacey Blows, hereby declare that the enclosed mini-thesis titled “*Factors associated with substance use among university students in South Africa: Implications for prevention*”, is my own work, and that all the sources that have been used or quoted have been indicated and acknowledged throughout the text. In addition, these sources have also been acknowledged and supplemented with a complete reference list. Furthermore, I declare that the following thesis not been submitted for any other degree or examination, at any other university, prior to this submission.

Full Names: Stacey Desire Blows

Date: 31 August 2020

Signed: 



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## Dedication

*Almighty God*; I wish to thank you most sincerely for your protection, strength, guidance, courage and reassurance throughout the course of my life. There were often times where my journey felt like an uphill battle with no peak in site, but, with every step of the way, you set in my path the necessary support to guide me, the love to strengthen me and the dedication to find and keep balance.

*Mother*, I am, for the most part, because you were. The unconditional love you gave to so many, continues to motivate my journey in life. It planted a seed which I continue to sow. The world truly was a better place with you in it. I love you Mother; thank you for all that you have given me.

To my *Father*, thank you for your constant support, love and belief in me and my journey. I could not have asked for a stronger, kinder, and more loving father. I love you, Dad.

To my *Family* and *Friends*, I love and thank all of you for your support. Some days you were sounding boards and sanity keepers, other days you were the sun rays pushing through all the clouds. But, perhaps more important, was that fact that *most days* you were *there* for me. Your presence meant so much to me. I appreciate all of you.

In addition, I would like to offer this piece of literature to the *dedicated students* who contributed their valuable time to this study; the *stakeholders* and *community members* who continue to fight the big fight against the plight of substance use and abuse in *our* communities. You truly are the bedrock required in every society.

To the many lives being affected by substance use and/or abuse. My prayers are with you. My hope is to be of assistance to you. None of what you are going through is your fault. Don't lose hope. "There was never a cloud the sun could not shine through". I will not give up on fighting with and for you. I only ask that you too keep fighting for you. *You* are worth fighting for.

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I wish to express my gratitude to following individuals and institutions for their direct and/or indirect contribution to making this research endeavour possible:

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- I would also like to thank my friends and family who supported me and offered deep insight into the study.
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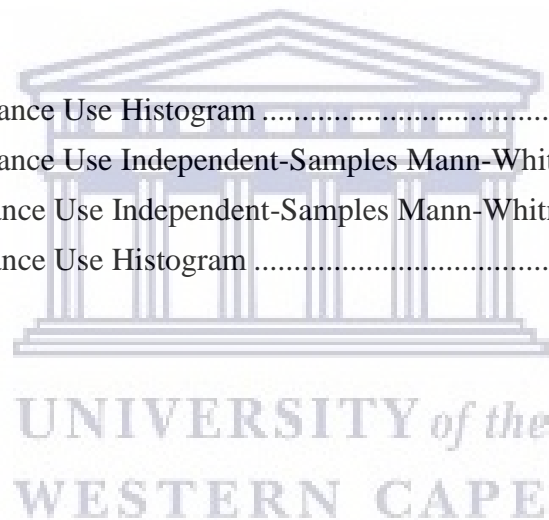


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## Chapter One

### Introduction

#### 1.1. Background and Rationale

Students enter universities with diverse academic, social, economic, and cultural backgrounds. More often than not, students' transition to university is a period characterised by psychosocial change, intense academic independence and separation pressures (Milojevich & Lukowski, 2016; Sommet et al., 2012). In addition to being exposed to this new environment, students are, in just a short period of time, also expected to make decisions for themselves, adjust to the new academic demands – whilst trying to find a balance between their social and academic lives (Laska et al., 2009). In light of this, many students find the university setting very challenging (Rozmus et al., 2005; Windle, 2003) and as a result, may succumb to destructive patterns of substance use and abuse (Arnett, 2005; Burrow-Sanchez et al., 2011; Fromme et al., 2008; Gopiram & Kishore, 2014; White et al., 2006).

The concern in such findings lies in the fact that, of the studies that have focused on this phenomenon, nearly all of them unite in the conclusion that the extent to which students consume alcohol and other psychoactive substances is growing among universities worldwide (Griffin, et al., 2015; Schulenberg et al., 2017). The term substance use can be defined as the use of any substance such as alcohol, illicit drugs, prescriptive and over-the-counter medication as well as tobacco at some point in an individual's life without the individual developing a specific recurrent pattern of use (Edmonds & Wilcocks, 2001). Whereas substance abuse refers to the continued misuse of drugs, alcohol, tobacco and other psychoactive drugs even though the individual has knowledge that their usage of these substances may cause several debilitating problems and may eventually lead to some form of addiction (World Health Organization [WHO], 2018).

To demonstrate the severity of substance use among university students, numerous studies have since compared substance use amongst university students to their non-university counterparts (Arria et al., 2013; Schulenberg et al., 2017; O'Malley & Johnston, 2002). Findings from such studies indicate that the use of alcohol – particularly getting drunk and binge drinking (Dawson et al., 2004; Schulenberg et al., 2017), marijuana (Schulenberg et al., 2017) and non-prescription amphetamine were considerably higher among university students when compared with their non-university attending peers (Schulenberg et al., 2017; National Institute on Drug Abuse [NIDA], 2017; Schulenberg & Patrick, 2012; Center for

Behavioral Health Statistics & Quality, 2016). Moreover, studies by O'Malley and Johnston (2002) as well as Arria and colleagues (2013) reported that a large number of students who had never before smoked cigarettes, drank alcohol or used any other type of stimulant or prescriptive drug were more likely to start once exposed to the university setting. In addition, these studies concluded that students who had prior exposure to substance use increased their frequency of use when entering the university setting (Arria et al., 2013; O'Malley & Johnston, 2002).

The university setting has thus been identified as a crucial environmental factor contributing to alcohol and drug use among students worldwide (Schulenberg et al., 2017; O'Malley & Johnston, 2002; United Nations Office on Drugs and Crime [UNODC], 2014). This being said, very few representative surveys on this phenomenon have been conducted in low-income countries, such as South Africa (Kyei & Ramagona, 2013; Pengpid et al., 2013; Young & De Klerk, 2008, 2012; Young & Manson, 2010). However, among the few studies that have been conducted, very high rates of alcohol use among students have been reported (Pengpid et al., 2013; Young & De Klerk, 2008; Young & Manson, 2010). For illustration, Young and De Klerk (2008) found alcohol prevalence rates of almost 50% at Rhodes University. At the same South African university, two years later, Young and Mayson (2010) studied the drinking norms of students living in the university's residences and found that 57.9% of the sample reported hazardous alcohol consumption, i.e. four or more drinks at a time on at least three separate days in the previous three months.

Similarly, another South African study carried out by Kyei and Ramagona (2013), at the University of Venda, found that while over 65% of the students surveyed use alcohol, 49% of those students abuse it. A more recent study conducted by Du Preez and colleagues (2016), which focused on the drinking behaviour of students at Stellenbosch University reported that 71% of males and 54% of females reported hazardous drinking patterns. Alarming, the study also found that 13% of the sample indicated harmful drinking behaviour.

The concern of such findings lies in the implications associated with substance use and abuse as it has been linked to the epidemics of violence, tuberculosis, HIV/AIDS (Cooper, 2002; Parks et al., 2012; Schneider et al., 2007; Seedat et al., 2009), increased homicides and suicides, depression, risky sexual behaviours and increased spread of sexually transmitted diseases amongst others (Department of Basic Education, 2013). For example,

Malaju and Asale (2013) found that university students who abuse alcohol were approximately six times more likely to be infected with HIV than their non-university counterparts. Apart from this, substance use and abuse has also been recognised to contribute to the high university dropout rates, unemployment, and high levels of poverty and crime (Griffin et al., 2015; Thomson, 2013).

In view of the aforesaid, research has shown that to intervene effectively and prevent the negative consequences emanating from substance use and abuse, it is important to identify socio-demographic (Beck et al., 2014; White et al., 2005; Young & De Klerk, 2012), environmental and psychological stressors (Becker et al., 2012; Fernander et al., 2006; NIDA, 2014) contributing to the use and misuse of substances. Cross-sectional studies have identified specific variables associated with substance abuse, the most reliable being socio-demographic variables such as age, gender (Beck et al., 2014; White et al., 2005; Young & Klerk, 2012), education level (Blanchard et al., 2000; Meade et al., 2009), marital status and living situation (Blanchard et al., 2000; Müller et al., 2008) among others.

In addition to socio-demographic factors, international trends indicate that substance use and abuse among university students often appear to be related to psychological stressors typically related to the demand to adapt to the new environment and academia (Bennett & Holloway, 2014). Consistent with this view, Demery et al. (2012) findings indicated that the exacerbating stress and tension associated with the campus environment increases the chance of substance abuse as many students entering university find it to be an upheaval experience which can induce or exacerbate mental health problems (Demery et al., 2012). According to Becker and colleagues (2012) psychological conditions such as stress, anxiety, and depression are important predisposing factors for substance abuse. A relatively recent study carried out by Kelly and Chan (2015) appear to support such findings as the authors found that 27.21% of substance abusers at an Australian university were at risk of psychological distress compared to only 11.39% in non-abusers.

## **1.2. Problem Statement**

The university population has been earmarked as being susceptible to the use and misuse of substances due to the rapid academic, social, and emotional transitions many students experience when first entering the university setting (Arria et al., 2013; Schulenberg et al., 2017; O'Malley & Johnston, 2002). While there is a compelling body of evidence speaking to the high prevalence of substance use, in particular, alcohol use among university students

globally (Schulenberg et al., 2017; Stevanovic et al., 2015; Griffin et al., 2015; UNODC, 2014), there is insufficient research to prove that a similar trend is prevalent among university students in South African (Young & Klerk, 2008).

Moreover, it is also important to highlight here that the aforesaid convergence of literature focused primarily on surveying information regarding the prevalence of substance use among students. This is observed in spite of the fact that ante date scientific and anecdotal research has repeatedly shown that in order to effectively intervene and prevent substance-related consequences, factors that predispose students to being more vulnerable to use and abuse substance need to be ascertained (Beck et al., 2014; White et al., 2005; Young & De Klerk, 2012).

In highlighting the preceding gap in research, it could, from a universal perspective, be argued that many governmental and/or university policy-makers from around the world have since not been able to sufficiently identify the needs of the student populations, nor are they informed enough to be able to develop and implement appropriate prevention, awareness, and intervention campaigns (Beck et al., 2014; White et al., 2005; Young & De Klerk, 2012). The prescribed implications of not having more tailored prevention, awareness and intervention campaigns are amplified by evidence which suggest that early exposure to substance use is often a precursor for future substance use, addiction, and many other physical and psychosocial problems among the youth later in life (Atwoli et al., 2011). Based on the implications associated with substance use, the need for such an investigation could not be overstated. This research study, therefore, aims to contribute to the understanding, development and management of more tailor-made substance use prevention, awareness and intervention campaigns specifically targeting university students in South Africa.

### **1.3. Aim**

The purpose of this study is to establish the prevalence of and contributory factors associated with substance use among students at a University in the Western Cape, South Africa.

### **1.4. Objectives**

The objectives of this study were to:

1. Determine the prevalence of substance use amongst students at a University in the Western Cape, South Africa.
2. Describe the types of substances that are commonly used.

3. Identify the factors associated with substance use among the students.

## **1.5. Research Questions**

The study attempted to answer the following questions:

1. What is the prevalence rate of substance use amongst students at the University?
2. What types of substances do the students commonly use?
3. What are the factors associated with substance use among university students?

## **1.6. Chapter Summary**

This chapter presented the overview and introduction of the study. The background information about the research problem, the statement of the problem, the objectives, and research questions that guided the study were discussed in order to contextualise the research topic. That which follows presents an outline of the structure of this thesis under relevant headings and sub-headings before proceeding with the literature review of the study.

### **1.6.1 Structure of the Thesis**

#### **Chapter 1: Background and Rationale**

This chapter presented an overview of the study including introduction, background of the problem, statement of the problem, aim and objectives of the study, definitions of key concepts, and scope of the study. Most of the points briefed in chapter one are discussed in detail in the subsequent chapters.

#### **Chapter 2: Literature Review**

Chapter 2 presents a review of the literature of the concepts of the study. The main aspects of substance abuse are discussed throughout while giving special emphasis to the factors associated with substance abuse among university students. Such factors are highlighted and presented based on the theoretical framework of the study.

#### **Chapter 3: Method**

This chapter provides a detailed description of the research methods that were employed throughout the study. This includes a thorough description of the study's research design, participant selection, procedure, data collection and analysis. This chapter further discusses the ethical considerations followed in the study in detail.

#### **Chapter 4: Findings**

This chapter presents the findings of the study: both descriptively and analytically.

#### **Chapter 5: Discussion**

In this chapter the findings from the research study were discussed. The ecological systems theory was used as a lens to interpret the results in order to provide a framework for prevention, with a primary focus on the Microsystem of the EST (as this is representative of the individual and his/her immediate social domains).

#### **Chapter 6: Conclusion**

Chapter 6 provides a summary of findings and elucidates the implications, limitations, and recommendations of the study.



## **Chapter Two**

### **Literature Review**

#### **2.1. Introduction**

The following chapter provides a review of literature on substance use and abuse, particularly among university students across the globe. More specifically, this chapter will provide the reader with a review of the global status of alcohol and substance abuse among university students with particular focus given to the prevalence, factors associated with and consequences of substance use and abuse.

A thorough literature review is an indispensable part of any research endeavour (Polit & Beck, 2012). According to Polit and Beck (2012), a thorough literature review should be comprehensive, systematic and up to date. This thesis's review of literature covers the most important aspects related to substance abuse among university students. This was done by providing a comprehensive global and local review of literature in terms of prevalence rates and the factors associated with the use and abuse of substances among university students. More specifically, the literature reviewed highlighted how factors such as gender, age, mental health and the university environment determine the likelihood of an individual to use and or abuse substances. In addition, the review includes a discussion of Bronfenbrenner's ecological systems theory, which was used as the theoretical framework underpinning the study.

#### **2.2. Global Status of Alcohol and Substance Abuse among University Students**

Various sources provide evidence that substance use is on the increase in most institutions of higher learning across the world (Arria et al., 2013; Ross & De Jong 2008; Griffin et al., 2015; Stevanovic et al., 2015; UNODC, 2014). In the wake of such findings, a report issued by the World Health Organisation (WHO) (2015) highlighted substance use among university students as being an important area of research due to the short- and long-term effects it has on the academic and social lives of individuals. In this regard, past and present literary work have reported numerous negative effects associated with students' substance use, such as, addiction later in life, chronic health outcomes, and other psycho-social related problems – to mention but a few. In an effort to address the concerns set out by WHO (2015), several international studies have looked at the prevalence of substance use and abuse (as will be discussed below), while very few studies have investigated the social, economic and contextual factors that have been associated with substance use among university students



worldwide – which, as the subsequent review of literature will show, is instrumental in any effort to mitigate and combat substance use and abuse among university students (WHO, 2015). In South Africa, even less is known, not only about the factors associated with substance use, but the actual prevalence rates amongst university students (Kyei & Ramagona, 2013; Pengpid et al., 2013; Young & De Klerk, 2008, 2012). This is the reality regardless of the fact that South Africa not only has the highest reported incidence of Foetal Alcohol Syndrome (FAS) in the world, (Western Cape Government, 2019), but its drug usage has been reported as being at twice that of the global norm (Jordan, 2015; Thomson, 2013).

## **2.3. Substance Use and the University Environment**

### **2.3.1. Global Prevalence of Alcohol and Substance Use among Students**

Literature suggests that institutions of higher learning will often be the first place for substance experimentation (Jaouahir et al., 2015). A plethora of studies have since earmarked the university setting as being a crucial environmental factor contributing to substance use and abuse among students globally (Arria et al., 2013; Bennett & Holloway, 2014; Jaouahir et al., 2015; Schulenberg et al., 2017; O'Malley & Johnston, 2002). Student alcohol use and abuse in the university context has become so prevalent that Schulenberg and Maggs (2002) refer to it as being the time representing the prime drinking years for young adults. To demonstrate the extent and severity of substance use among university students, numerous studies have since compared the university students to their non-university counterparts (their age-peers who are not attending university/college) (Arria et al., 2013; Schulenberg et al., 2017; O'Malley & Johnston, 2002).

O'Malley and Johnston (2002) carried out one such study comparing the university student to their non-university counterpart in which their findings indicated that alcohol abuse among university students is twice that of their non-university peers. In terms of the “non-university peers” – this group of people were born in the same year (a birth cohort). More alarmingly, in addition to detecting the high prevalence of alcohol abuse among the sampled students, the authors also found that a student who had never smoked cigarettes, drank or used any type of stimulate or prescriptive drug were more likely to start once exposed to the university setting (O'Malley & Johnston, 2002). In this regard, the findings appear to support the priori argument suggesting aspects of the university or college experience may well predispose students to use and/or abuse substances.

Similar findings, more than a decade later, were reiterated by researchers such as Arria and colleagues (2013) who, in addition to reporting novice use, also found that students who had prior exposure to substance use increased their frequency once exposed to the university environment (Arria et al., 2013). In a similar vein, a study carried out at the University of Tehran in Iran found that students who had prior exposure to substances increased their usage once entering university as the findings indicated that while 61.3% of respondents in the study started smoking after entering university, 63.3% of the respondents increased their smoking when they join university (Jafari et al., 2011).

In addition to reporting on the high prevalence of substance use among university students as opposed to their non-university counterparts, the Monitoring the Future (MTF) research programme in the United States of America (USA), one of the most relied-upon scientific sources of information evaluating substance use prevalence rates among college students and their non-college peers, produced longitudinal data which revealed growing annual prevalence rates of illicit drug use among college students. Used in this context, term 'illicit' drugs refers to the use of marijuana, hallucinogens, cocaine, heroin or other narcotics, amphetamines, sedatives (barbiturates), or non-prescription tranquilizers (Schulenberg et al., 2017). In this regard, the MTF's findings revealed an increase in substance use from 34 percent in 2006 to 43 percent in 2016, making it the highest it has been for the last three decades.

The MTF's findings appear to be supported by numerous other studies in the USA, one of which was carried out by Kalsi (2015) who found that nearly half of full-time university students binge drink or use prescription drugs and about a quarter of those students meet the criteria for substance use related disorder or dependence. The findings of the study were extremely alarming as they revealed prevalence rates three times higher than in the general population. In addition, the study also found that the number of college students abusing prescription drugs have more than doubled when compared to the early 1990's, increasing from two to four percent respectively. Based on the study's findings Kalsi (2015) called for increased efforts to develop interventions specifically aimed at students at institutions of higher learning.

Although yielding important information, the aforesaid study does come with its own limitations. For one, in reporting the findings the author had not indicated the methodology used to identify the student population under study. Such an oversight has implications on the

generalisation and reliability of the study's findings. In addition, the study was not comprehensive in its scope as it precluded details regarding substances other than alcohol and prescription drugs. Interestingly, the author also fell short in his attempts to investigate and/or report on the different risk factors that exposed university students to alcohol and substance abuse even though one of the primary aims of the study was to present students' experience of substance abuse and subsequently provide information regarding a potential solution that could assist in mitigating the problem (Kalsi, 2015).

With an increased effort to examine specific factors that predispose university students to consume alcohol, Weitzman and fellow researchers (2003) conducted a study in the USA with the aim of examining individual, social and environmental factors that may influence binge drinking among college students. The study consisted of a twenty-page self-report questionnaire that was mailed to a random sample of students at different 4-year colleges in the USA. The overall response rate of students was 60 percent, which equated to a total number of 1894 first year students. The results of the study indicated that approximately 26 percent of participants reported to have consumed alcohol. Of which, the findings further revealed that a clear majority of students began consuming alcohol only after entering universities or colleges. The process of socialisation within the university setting appeared to be the main reason for consuming alcohol, as many participants reported to view drinking as a means to make new friends and fit in.

In addition to the aforesaid, Weitzman et al. (2003) also found that availability, affordability, and accessibility of alcohol through peers and outlets near colleges were reported as being important factors predisposing the initiation of binge drinking among college students (Weitzman et al., 2003). In discussing their findings, Weitzman and colleagues recommended both pre-college interventions as well as college interventions aimed at creating substance-free student dormitories and restricting easy access to alcohol on campuses. When interpreting the results of this study it is important to consider the limitations inherent in its methodology. For example, the study consisted of mailing self-report questionnaires to students. This data collection process is well-known for its disadvantages, such as high non-response rates and possible misinterpretations of questions. Furthermore, the study only enlisted first-year students under the age of 19 years old, which does not allow the researchers to compare alcohol use across year level and age group. The

study also focused exclusively on alcohol abuse, which limited the comprehensiveness and validity of the findings (Weitzman et al., 2003).

Karama et al. (2007), who focused primarily on providing an international perspective on the topic of alcohol abuse among college students conducted a more extensive study in the form of a systematic review. The study reviewed a total of 26 peer-reviewed journal articles from Australia, Brazil, Ecuador, Egypt, Germany, Hong Kong, Ireland, Lebanon, New Zealand, Nigeria, Sweden, the Netherlands and Turkey, in order to survey the prevalence of alcohol use, problems associated with it and the effectiveness of existing intervention methods. Results of the study indicated that college students are at elevated risk for heavy drinking when compared to the general population in many countries; causing serious immediate and long-term health risks, such as drinking-and-driving and other substance use; as well as alcohol dependence. Furthermore, the study inferred that the prevalence of alcohol abuse appeared to be at its highest in Australia, Europe and South America, where comparable prevalence rates were detected.

Interestingly, the systematic review also revealed an unambiguous difference in the prevalence of alcohol use in the African context as their findings revealed much lower prevalence of alcohol and substance use in Africa when compared to other countries around the world. This contrast, could, however, be attributed to the fact that the review only considered findings from two African studies that were carried out in Egypt and Nigeria. Here it is also important to be cognisant of the fact that both African countries' studies reviewed have specific cultural and religious backgrounds that vary significantly from the rest of Africa, which could further explain the lower prevalence rates detected in the respective countries. In addition, the two studies consisted of small sample sizes. As such, the findings of the study are less likely to be representative of Africa, making the findings less reliable. In addition, as with the previous study by Weitzman and colleagues (2003), this study also focused exclusively on alcohol abuse without considering other types of substances which could have implications for intervention and prevention campaigns aimed at alleviating substance use and abuse among university students (Karama et al., 2007).

Contrary to the findings presented above Francis et al. (2014) reviewed published literature on the prevalence of alcohol use and abuse among young people in East Africa. The study published findings that revealed very high rates (82%) of substance use among university students when compared to the general population. Their findings correspond to

those of Arria and colleagues (2013) and O'Malley and Johnston, (2002) who similarly concluded that many university students, including those who have never tried substances initiate use of alcohol and substance after being exposed to the university environment. Although the study's findings appear to be in-line with global trends of substance use among university students, the researchers (Francis et al., 2014) acknowledged that the studies under review lacked transparent presentation of data relating to onset, patterns and lifetime prevalence of alcohol use. Furthermore, this study, similar to the study carried out by Karama and colleagues (2007), only focused on the prevalence of alcohol abuse and, it did not explore the factors that expose students for alcohol abuse. Notwithstanding the above study's limitations, the study's findings acknowledged the pervasive nature of alcohol use among university students. Calling for urgent intervention that specifically targets university students who are at increased risk of alcohol and substance use and abuse. The authors (Francis et al., 2014) further endorsed the use of standardised alcohol screening questionnaire for future scholarships in the field in order to validate results and justify the need for additional research.

In-line with the previously mentioned findings, a study carried out in Nigeria by Adekeye et al. (2015) reported exceedingly high prevalence rates among undergraduate students in Africa. In this particular study, the researchers administered a standardised drug abuse questionnaire to a sample population of 431 participants. The researchers' findings indicated that substance use was widespread among university students, where tobacco (cigarette smoking) and the use of alcohol were found to be 81 and 74 percent respectively. Furthermore, the findings also disclosed various forms of adverse on effects students' experience, such as, academic difficulties, law-breaking behaviour and, increased cravings for substances in order to feel high.

Another important finding revealed in the aforesaid study was the high proportion of students (45%) who reported feeling depressed. This finding was noted as a cause for concern as depression could lead to serious mental problems as well as suicide ideation. On the whole, this study's findings contradicted the findings carried out by Karama and colleagues (2007), by demonstrating that, not unlike developed countries, substance use in Nigeria was significantly high (Adekeye et al., 2015). Yet, the study above does not come without its own limitation as participants recruited in the study were both under and over the age of 18 years, which limits comparison across year of study and age group. In addition, the study did

not consider contributory factors other than concluding that parental use of alcohol and peer pressure were not significant predictors of substance use. Interestingly, such findings are in opposition to numerous other studies that attributed peer pressure and parental use to be major contributors for adolescent's alcohol and substance abuse (Adekeye et al., 2015).

Another study carried out in Kenya by Atwoli and colleagues (2011) supports similar findings to that of the previous two studies carried out in Africa (Francis et al., 2014; Adekeye et al., 2015). In this study, the researchers surveyed 478 students from a Kenyan university in order to explore the extent of substance abuse among students. The results of the study demonstrated that 52 percent of the enrolled participants reported a lifetime prevalence of alcohol use. Amid those who reported lifetime prevalence, 97 percent of them admitted to having had an alcoholic beverage in the preceding week. Furthermore, the study's findings also uncovered high rates of substance abuse among university students, reporting student lifetime usage to be 69.8 percent. When looking at the specific substances use, the study revealed that approximately 43 percent of participants reported using tobacco (cigarette smoking) at least once in their lifetime. In terms of gender being a factor contributing to the use of substances, the researcher found that lifetime cigarette smoking was higher for males (47.5 percent) as when compared to females (37.5 percent).

While the above study's findings above illuminate the high risk of alcohol and substance abuse among university students, the study did not investigate the level of exposure and other factors such as age strata between university students. Furthermore, the study's findings focused specifically on reporting on two substances, namely alcohol and tobacco even though the questionnaire employed surveyed for the use of various drugs including stimulants, marijuana, cocaine and heroin, among others (Atwoli et al., 2011).

### **2.3.2 Magnitude of Alcohol and Substance Use among University Students in South Africa**

Among the few South African studies, researchers have found that alcohol prevalence rates among South African university students are not different from other universities around the world (Kyei et al., 2001). As a case in point, Young and De Klerk (2008) undertook a two-year survey to determine the prevalence and distribution of safe, hazardous, harmful and dependent drinking using the Alcohol Use Disorder Identification Tests (AUDIT) among students at Rhodes. From the 3,168 students who participated in the study over the two years,

just over half of participants (57%) exceeded the clinical cut-off score for safe drinking (eight). In 2007, 29.4% of females and 37% of males were classified as hazardous drinkers. Similarly, in 2008, 29.8% of females and 38.3% of males were categorised as hazardous drinkers (Young & De Klerk, 2008).

The above study surveyed 2049, representing slightly more than one third of all registered students. The researchers used the Alcohol Use Disorders Identification Test (AUDIT), which was incorporated into the Rhodes University StudentZone website in such a way that all registered students would have the opportunity to complete the test only once. The authors furthermore recognized alcohol as a major public health concern since its effects are likely to result in serious medical, social and academic consequences, such as death and injury (Hingson et al., (2002), unsafe sex (Wechsler et al.,2000), antisocial behaviour, criminal justice problems and academic failure (Wechsler et al., 2002) amongst others.

Notwithstanding the useful contributions of this study, several limitations should be noted of which scope is one. The aforesaid study only looked at alcohol and did not provide any indication of the degree of other substances used. Moreover, only students who had access to the StudentZone website had the opportunity to partake in the study, which questions the generalisability of the results. This said, the authors indicated that the findings nonetheless suggest that the findings are of particular concern because the excessive drinking at a university is likely to influence the drinking behaviour of new students when they first arrive (Borsari & Carey, 2001). In this regard, the authors recommended that in order to prevent universities from being places where people develop alcohol disorders, university administrations should curtail excessive student drinking where this is possible. Furthermore, the authors hoped that their study would prepare the way for a coordinated effort to investigate and share data and strategies to contain alcohol abuse on our campus amongst South African universities (Young & De Klerk, 2008).

At the same South African University, two years later, Young and Mayson (2010) set out to improve on Young and Klerk's (2008) findings which relied on two large convenience samples by employing a probabilistic sampling method as a means to minimise bias. In doing so, the authors focused on the drinking norms of students living in the university's residences in an attempt to formulate future social norms interventions that would enable university students to compare their drinking to a corresponding reference group. Towards this end, a two-stage random cluster sampling was used to obtain a representative sample of students

living in the undergraduate residences. To achieve this the authors set out to reach a minimum sample size of 300, which equates to 10% of the total residence population. The random number function on Excel was used to randomly select seven of the 11 undergraduate halls in which one out of four residence was randomly selected from each of the seven respective halls selected. Out of the total number of 408 students, 318 of them completed the Alcohol Use Disorders Identification Test (AUDIT) at house meetings in the presence of one of the researchers, which provided a response rate of 78%.

The results of the study indicated that while 42.1% of the sample drank safely (a pattern of alcohol intake that does not necessarily increase the risk of adverse physical, psychological, or social consequences to the individual or others) (Babor et al., 2001), a more compelling and concerning finding was that 57.9% of the sample of residence students drank at least hazardously, which according to the AUDIT guidelines refers to a pattern of alcohol use that increases the risk of harmful consequences without having yet caused any alcohol-related harm for the user or others (Babor et al., 2001).

Given the alarming findings above, Young and Mayson (2010) highlighted the findings as a cause for serious concern and a call for increased efforts to curtail excessive drinking behaviour among students. In terms of the study's limitations, one limitation of the study concerns the privacy of the respondents as the questionnaire was administered within a group setting at house meetings, which might have compromised and subsequently influenced some of the participants' responses. Another limitation acknowledged by the authors themselves is the lack of the finding's overall generalisability since the data was drawn from a single institution and, although the sampling method used was appropriate to inform institution-based social norms interventions, it is not possible to make national generalisations. Furthermore, the utility and reliability of the AUDIT in the South African context is encouraged and endorsed throughout the findings, so much so that the authors conclude by encouraging other South African institutions of higher learning to follow suit by using this measure and contribute to a pooled national dataset.

In a comparable cross-sectional study, yielding similar results, Kyei and Ramagoma (2013) found extremely high alcohol prevalence rates among students at the University of Venda. The results presented indicated that while over 65 percent of the students use alcohol, 49 percent of those students abuse it. This being said, the study's results were based on a comparatively smaller sample of students ( $N = 209$ ). Although the study's sample size was



relatively small, the type of sampling employed, i.e. stratified random sampling allows the researchers to generalize their findings. In-line with the preceding studies carried out in South Africa, this study likewise focused on alcohol consumption at the expense of looking at other substances that could be important in identifying substance use problems among the university population.

A more recent study was conducted at the University of Stellenbosch (Du Preez et al., 2016) to gain insight into the drinking behaviour of South African university students. This study was carried out in order to make available recommendations that could potentially aid in the development effective education campaigns and responsible drinking programmes. A convenience sample of 474 of both undergraduate and postgraduate South African University students was surveyed in this study. It should be noted that of the respondents surveyed, all of them were identified as South African citizens and frequent drinkers (having consumed alcohol during the preceding 12 months of the study). The data was collected in paper and pencil format by using measurement instruments, which included the Alcohol Use Disorder Identification Test (AUDIT), the Drinking Expectancy Questionnaire Revised (DEQ-R), and the Drinking Motives Questionnaire Revised (DMQ-R). The finding's results revealed that 71 percent of males and 54 percent of females reported hazardous drinking patterns. More alarmingly, the study also found that 13 per cent of the participants indicated harmful drinking behaviour (Du Preez et al., 2016).

The study also found that of the university students sampled, most students reported to use alcohol to experience increased levels of enjoyment at university social gatherings and to enhance or maintain positive emotional states, such as feelings of excitement or joy. These findings are supported by previous research relating to self-reported drinking which have similarly found a positive relationship between social and enhancement motives and drinking behaviour (Cooper, 1994; Hasking et al., 2011). Interestingly, the researchers also found that students in this sample did not report to consume alcohol in efforts to reduce or avoid negative affective states such as anxiety and depression nor did they report to drink because they felt left out of a group (Du Preez et al., 2016).

The above results, although useful, reveal a number of limitations. One of which the sample size and the use of convenience sampling limits the generalisability of the results. Furthermore, the study failed to disclose how the sample of students were chosen, given that they were identified as "frequent drinkers". In addition, the study did not look at other types

of substances used by students. This being said, the authors are hopeful that the results from their study will encourage academia to carry out continued research into the drinking behaviour of South African university student (Du Preez et al., 2016).

In stark contrast to the high prevalence rates reported above (Du Preez et al., 2016; Kyei & Ramagoma, 2013; Young & Klerk, 2008; Young & Mayson, 2010) an earlier study conducted by Peltzer and colleagues (2002) at the-then University of the North (since renamed as the University of Limpopo) in the Limpopo Province of South Africa, examined the prevalence of substance use among 799 first year students chosen at random from the total first year University of Limpopo's student population ( $N = 1712$ ). In this particular study, the researchers chose every second student from a list of all the first-year students at random and invited them to participate in the study. After accepting their invitation, all students were administered questionnaires to complete in their respective classrooms with project staff members present to explain different concept and answer any questions. The findings of the study indicated that smoking cigarettes (13%) was the most commonly used substance followed by alcoholic drinks (11%), other opiate type drugs (10%), and cannabis (6%) in the past month (Peltzer et al., 2002). The authors of this study reported one limitation regarding the generalisation of their findings, given that only one university was included in the sample. Another limitation to consider, however, is the sheer magnitude of the questionnaires used in this study, as a total of eight measures were administered which included an exhaustive list of questions (a tallied 145 questions). Furthermore, the study only focused on first-year students thereby preventing cross tabulation among variables of age and academic year of study.

A more recent study conducted at the same university (University of Limpopo) in order to determine the association between mental health, substance use and HIV sexual risk behaviour among revealed that only 22.2% of the students under study were hazardous or harmful drinkers (Pengpid et al., 2013). The researchers in the study employed a cross-sectional survey design that included self-administered questionnaires dispensed to a convenience sample of 732 undergraduate students. Limitations to consider in this study include issues surrounding sampling and the manner in which participants were recruited. The research team undertaking this study approached undergraduate students while they were entering two public venues on the campus. Here two things are important to take into account, one being the validity of results from the questionnaires, as students most likely

completed it in a hurry, since they were recruited in-between classes; and two, students who use or abuse substances would be less likely to be in class in order to complete the questionnaire. Students' apprehensiveness to report on items related to illegal drug use (cannabis) could have also affected their responses, and by inference, the overall results of the study. As such, generalisation of the study's findings should be interpreted with increased caution.

In addition, the study only focused on full-time, conveniently selected undergraduate students between the ages of 18 and 41 year, thereby excluding part-time and postgraduate students, which prevents comprehensive cross-tabulation between students' age strata and year levels. A further limitation was that the study only documented tobacco, alcohol and cannabis use, thus limiting identification of the overall range of substances used by students. This oversight could be important in the development and/or tailoring of any awareness and or prevention campaigns designed to reduce substance use and abuse among students.

The above-mentioned South African studies, even though a few, showed varied results regarding the alcohol prevalence rates among students at South African universities. As it was very high at Rhodes University, with a rate of more than 57 percent of students being classified as hazardous drinkers (Young & Mayson, 2010), similarly at Venda University, 49 percent reported alcohol abuse (Kyei & Ramagoma, 2013). In a more recent study carried out at Stellenbosch University, high alcohol rates were likewise ascertained since 71 percent of males and 54 percent of females reported hazardous drinking patterns (Du Preez et al., 2016). In contrast, however, a much lower rate of abuse was found at the University of Limpopo (22%) (Pengpid et al., 2013). Furthermore, the rates found at the University of Limpopo are much higher than what was reported in an earlier study, where 11% of students at the University of Limpopo (Peltzer et al., 2001) were drinking hazardously. Currently, no literature offers a discussion on the possible reasons for these differences across university students. However, the likelihood of disposable income might play a role among students in different universities.

The aforesaid global convergence of literature appears to suggest that some aspect of the university or college experience predisposes students to use and/or abuse substances – positioning university students as being a vulnerable population in need of increased attention and renewed intervention (Arria et al., 2013; Bennett & Holloway, 2014; Jaouahir et al., 2015; Schulenberg et al., 2017; O'Malley & Johnston, 2002). With results indicating that, not

only are university students at elevated risk for substance use and abuse, particularly, heavy alcohol use and abuse when compared to the general population in many countries (Karama et al., 2007); Johnston, 2017; Francis et al., 2014) but that the majority of university students, including those who have never tried substances, initiate use after being exposed to the university environment (Arria et al., 2013; O'Malley & Johnston, 2002). Against this background the process of socialisation (Weitzman et al., 2003) and feeling depressed (Adekeye et al., 2015) have been identified as some reasons for using substances when first introduced to the university environment setting – which could suggest that there is an increased vulnerability among first year students.

Among the few studies carried in South Africa, alcohol prevalence rates among university students appear to mirror those from other universities around the world (Du Preez et al., 2016; Kyei & Ramagoma, 2013; Peltzer et al., 2001; Pengpid et al., 2013; Young & De Klerk, 2008; Young & Manson, 2010). This being said, it is important to bear in mind that while the university setting has been identified as being conducive to the initiation and exacerbation of substance use and abuse globally (Arria et al., 2013; O'Malley & Johnston, 2002), very little has been ascertained in respect of whether this is the case in the South African context.

Moreover, most of the findings reported on in South Africa did not provide any indication of the degree of other substances used on university settings apart from alcohol (Du Preez et al., 2016; Kyei & Ramagoma, 2013; Young & De Klerk, 2008), even though drug usage in South Africa has been reported as being at twice that of the global norm (Jordan, 2015; Thomson, 2013). In terms of the factors that motivate alcohol use among within the university context, Du Preez and colleagues (2016) found that of the sampled students, most of them consumed alcohol to achieve heightened emotional states at university social gatherings and to enhance or maintain positive emotional states, such as feelings of excitement or joy.

Furthermore, it should also be noted that most of the studies carried out in the South African context have focused primarily on surveying information regarding the prevalence of substance use at universities, while not paying enough attention as to why students' use and abuse substances upon entering universities. As a result, it could be said that substance use awareness and prevention campaigns developed for the South African university students have not of necessity been duly informed by context specific scientific findings.

## 2.4. Substance Use and Gender

According to literature, the most reliable variables associated with substance abuse are socio-demographic variables, mainly gender (Beck et al., 2014; Becker et al., 2012; Verhagen et al., 2015). Literature on the subject suggests that substance abuse among females is notably less compared to their male counterparts (Becker et al., 2012; Jain, 2013; Lemelin et al., 2014; Verhagen et al., 2015). In this regard, many findings suggest that males are both genetically (Becker et al., 2012) and socially (Brady & Randall, 1999; Jain, 2013; Madu & Matla, 2003; Sorsdahl et al., 2012) more susceptible to substance abuse than when compared to their female counterparts (Becker et al., 2012).

More recent findings substantiating such claims were carried out by the Center for Behavioral Health Statistics and Quality (2016), which indicated that men are more likely than women to use almost all types of illicit drugs. Used in this publication, the term “illicit” refers to the use of illegal drugs, together with marijuana and the misuse of prescription drugs. In terms of gender disparity, not only has research shown that the prevalence of substance abuse differs between males and females in most cases, but it has also ascertained the reasons for why abusing substances is different for both genders (Becker et al., 2012).

Published in the journal of *Biology of Sex Differences*, Becker and colleagues (2012) hypothesised that different historical, cultural, social and biological factors account for sex differences in substance use and abuse. In investigating such factors, the researchers found that males are more inclined to participate in risky behaviours such as experimenting with drugs in order to experience its positive reinforcing effects. It further found that with males who are genetically predisposed to substance use, experimentation with substances were more likely to end in addiction at a later stage. Regarding females, the study indicated that females on the other hand, more often than not, initiated drug use as a means to self-medicate in order to reduce stress or alleviate psychological distress.

Although useful, biological differences in substance use are usually challenged or seen in addition to psychosocial factors, which may contribute to variations in substance use and abuse between genders (Jain, 2013). Such factors include, but are not limited to, the perceptions of stigma and societal roles constructed by societal norms (Jain, 2013; Sorsdahl et al., 2012) In this area of research, Brady and Randall (1999) found that members within a given society often have a harsher social response to women using substances and, as such, women report less usage than men do. In some cases, it is thought that women with substance

use problems are seen in a negative light, and with that, experience a lot more social judgment when compared to men. Similar to findings by Brady and Randall (1999) and Sorsdahl, and colleagues (2012), a South African study published in the Journal of Adolescence, Madu and Matla (2003) found that the difference in alcohol consumption among male and female students is mainly the influences of morals, values and gender socialization.

On the contrary, however, there are many studies, which postulate that there is in fact no gender difference in the prevalence of abuse of several substances (Hoffman & Al'absi, 2013; Rozenbroek & Rothstein, 2011; Substance Abuse and Mental Health Services Administration [SAMHSA], 2014). For example, research has shown that among adolescents', there are equal numbers of males and females aged 12–17 using illegal drugs (SAMHSA, 2014). These findings align with more recent studies such as those carried out by Damato (2017) which used data from the 2013 Youth Risk Behavior Survey (YRBS) surveying grade 9-12 high-school students ( $N = 13,583$ ) in the USA, which similarly found no significant gender differences in cigarette smoking, alcohol drinking, and drug use. Interestingly, in South Africa, among a similar cohort, the 2002 National Youth Risk Behaviour Survey showed gender disparity among high school students as it recorded that 29.3% of the male and 17.9% of female students reported binge drinking (Reddy, et al., 2003). Although, it should be noted that the results obtained from Reddy and colleagues are relatively dated and cannot therefore be adequately compared to the results found by Demato (2017).

In terms of the two international studies cited above (Damato, 2017; SAMHSA, 2014) – it too comes with its own limitations as the data used to describe the prevalence of substance use among high school students in the United States were collected in 2014 and 2013 respectively. Thus, the data may not be accurate to capture current substance use and abuse practices and behaviours of student, much less university students. Furthermore, in both studies, substance use practices were self-reported, and responses could be biased in this context (underreporting or over-reporting of behaviours).

In terms of studies focusing primarily on gender disparity among university students, numerous studies concur with conclusion which postulate that males are more likely than females to engage in substance use and abuse (Becker et al., 2012; Center for Behavioral Health Statistics and Quality, 2016; Sorsdahl et al., 2012; Webster et al., 2014). For example,

a study conducted on Canadian students indicated that males are more likely to abuse substances when compared to their female counterparts (Webster et al., 2014). Additionally, the study found that males who smoked tobacco were more likely to abuse marijuana when compared to their female counterparts (Webster et al., 2014). Similarly, a study carried out in the Netherlands by Verhagen et al. (2015) disclosed that the prevalence of alcohol use and marijuana abuse among male students was higher than when compared to their female counterparts. Another international study conducted by Maier et al. (2013) indicates that male university students in Switzerland abuse a neuro-enhancer drug, methylphenidate (3.1%), at a higher rate than their female (1.5%) counterparts. Similarly, a cluster analysis on American students carried out by Primack and colleagues (2012) found that smoking cigarette was higher (61%) than those recorded for their female counterparts (28%) (Primack et al., 2012). Evidently, the reports above illustrate higher prevalence of substance abuse among men than women.

Substance abuse among South African students also show large gender-based variation (Reddy et al., 2003; Young & De Klerk, 2008). Substance use studies conducted at university institutions in South Africa reveals that the prevalence of alcohol consumed is higher among males as opposed to females, and more male students participate in hazardous and harmful drinking than their female counterparts. For example, the study by Young and De Klerk (2008) found AUDIT scores that were significantly higher for men than they were for women in the sampled population. Statistics showed that harmful drinking among males were 11.8 percent when compared to females, which was 6.3 percent. Furthermore, the findings showed that whilst 6.8 percent of females appeared to be dependent, 14.1 percent of males were classified as being dependent on alcohol.

In the aforesaid study the authors detailed that while males in the sample appear to be more at risk of alcohol abuse, increased caution should be placed on this interpretation since literature suggest that after ingesting the same dose of alcohol, higher blood ethanol levels are detected in women when compared to men (Young & De Klerk, 2008). Supporting Young and De Klerk's (2008) claims regarding gender differences in terms of blood ethanol levels, studies carried out by Frezza and colleagues (1990) and Lieber (1997) found that not only are women often smaller than their male counterparts but their body weight (per kilogram), contains less water, and has decreased gastric alcohol dehydrogenase activity. – resulting in a

greater quantity of alcohol passing into their bloodstream. As such, the interpretation of results comparing the two genders should always be carried out with great caution.

Kyei and Ramagoma's (2013) findings correspond to those of Young and De Klerk (2008) as the authors (Kyei & Ramagoma, 2013) categorically reported that a strong relationship exists between sex/gender and alcohol, citing alcohol use prevalence among male students at 71.7 percent compared to females which was 54.5 percent. Consistent with such findings, the study conducted by Young and Mayson (2010) indicated that male students reported a statistically significant higher mean AUDIT score than their female counterparts. It is, however, important to keep in mind the shortcomings of both studies as previously mentioned. For example, Kyei and Ramagoma (2013) study's results were based on a small sample of students ( $N = 209$ ). In addition, even though the study carried out by Young and De Klerk (2008) had a large sample size ( $N = 3168$ ), the study only surveyed students who had access to the StudentZone website.

Even though there seems to be a statistically significant difference between male and female alcohol consumption in the previously mentioned findings, such differences between sexes are significantly lower than results found in studies conducted in other countries within Africa, where prevalence of substance abuse among men students outnumbered women students by two-fold (Kassa et al., 2014). For example, a study carried out among Ethiopian high school students uncovered male substance use rates of 66 percent when compared to 34 percent among their female counterparts (Birhanu et al., 2014).

Another study conducted on Rwandan youths regarding substance abuse showed that substance abuse among males (67.03%) was double than that of females (36.92%) (Kanyoni et al., 2015). Although the results show a greater disparity between male and female substance use, currently no explanation exists that could account for the differences between countries within Africa. However, as found in studies reported on in Egypt and Nigeria (Karama et al., 2007), specific cultural and religious backgrounds that vary significantly from the rest of Africa could provide an explanation for such differences.

The above review on gender as a factor influencing the use and abuse of substances seems to show a consistent difference between genders when it comes to alcohol consumption where females consume substances less than their male counterparts (Becker et al., 2012; Center for Behavioral Health Statistics and Quality (2016); Kanyoni, 2015; Kyei &



Ramagoma, 2013; Meyer, 2011; Reddy et al., 2003; Verhagen et al., 2015; Young & De Klerk, 2008). An important observation made in the aforesaid findings is that much of the literature focuses on the disparity between genders in terms of alcohol use and abuse while very little attention was given to other types of substances – which could be deemed an essential oversight in any effort to determine whether a similar trend exists for other substances, as such information is vital for the creation of effective awareness-, prevention-campaigns as well as intervention strategies.

## **2.5. Substance Use and Age**

Even though the epidemics of substance use and abuse are known to affect individuals of all ages, the period between adolescence and adulthood (18 years to 29 years) (Galanter, 2006) (roughly the age when most students enter university) is deemed to be a crucial developmental stage, which, due to the physical, psychological, and social changes young students experience when reaching the university setting, further predispose students to be involved in substance experimentation (NIDA, 2014). Such assumptions are further endorsed and supported by White and colleagues (2005) who likewise suggest that, developmentally, individuals considered emerging young adults who enter university for the first time find themselves in a unique position of change in which one of the most difficult tasks is having to balancing their newfound independence and responsibilities and may, therefore, resort to substance use as an effort to cope (White et al., 2005). Age has thus also been identified as an important socio-demographic factor when investigating substance use and abuse among university/college students.

Literature suggests that university students appear to consume significantly more alcohol in their first year at university than in their second and third years of studying (Bewick et al., 2008), suggesting that age might influence drinking behaviour among university students. Many studies suggest that first-year students are more vulnerable to partake in substance use, as they are more likely to socialize in contexts that include alcohol use (Harford et al., 2002). Such claims are buoyed by studies such as those carried out by O'Malley and Johnson (2002), Arria and colleagues (2013) and Johnston and colleagues (2017), who found that the majority of university students in the age group of 18 years to 22 years old, consume more alcohol than their peers who do not attend university. Moreover, results from the 2005 National Survey on Drug Use and Health in the USA showed that alcohol consumption peaks at ages 21 to 23 (49.9 percent at age 21, 46.6 percent at age 22,

and 47.7 percent at age 23) (O'Malley & Johnson, 2002). As such, university students, who are considered a subgroup of young adults, are characterised by heavier, more frequent, and even more dangerous drinking patterns than their non-student peers (Schulenberg et al., 2017; Kypri et al., 2005; Slutske et al., 2004).

In the South African context, a study carried out by Peltzer and colleagues (2011) likewise support the claims above as it was observed in their findings from a national population-based survey, that binge, hazardous and harmful drinking increases significantly from adolescence (15–19) into young adulthood (20–34), being at its peak during young adulthood. Furthermore, the authors illustrated a slow decrease as individuals' progress through middle age and found the lowest prevalence among individuals over the age of 65. This being said, more recent data gathered from university students (N = 474) within South Africa, interestingly found no statistically significant differences between the age of university students and alcohol consumption behaviour (Lategan et al., 2017). Suggesting that university students' drinking behaviour is not dependent on their age. Although a possible explanation for these contradictory findings could be, the result of some methodological limitations as previously noted in the study by Lategan and colleagues (2017). For example, the use of convenience sampling, the size of the sample and the use of self-report measurement instruments. As such, the cohort sample in this study cannot be regarded as representative of all South African university students.

A comparable study conducted in the USA by Stewart and Moreno (2013) aimed to examine how student's attitude, intent and behaviour towards tobacco and marijuana changed during their first year of university found that the use of tobacco and marijuana has become a crucial part of the 'college experience' among first-year university students. The study included a total 275 participants and data was collected by means of telephone interviews during and after student's first year of study. The report summarised that participant's attitude and intention towards the use of substances significantly increased during the first year of their academic life. Illustrating that 12.2 percent and 13.5 percent of study participants had initiated tobacco and marijuana respectively during their first year of study. More alarmingly, the findings showed that by the end of a student's first year of study, almost half of them started using tobacco and marijuana. The researchers concluded that younger students were more vulnerable to the use and abuse of substances and further postulated that universities are favourable environments for tobacco and marijuana use (Stewart & Moreno, 2013).

It is important to note that the above study by Stewart and Moreno (2013), although useful, only enrolled first-year students between 18 and 19 years. Thereby limiting comparison between the different ages of university students. Furthermore, the study did not explore other substances commonly associated with university student's substance use and abuse such as alcohol. This shortcoming limits the findings coverage so as to demonstrate the true extent of substance abuse among university students (Stewart & Moreno, 2013).

Another cross-sectional study conducted in England by Penny and Armstrong-Hallam (2010) found that 83 percent of first-year university students reported using alcohol. More specifically, the researchers found that non-drinkers were more likely to be male, aged 21 and over. On the whole, the findings of the study relating to the age of students showed statistically significant age differences between students, with more than half of students who consumed alcohol fall into the 18-20-year-old age category compared to just over a third of the non-drinkers. In contrast, nearly half of the 'non-drinkers' fell into the 21-30-year group.

The findings from the above-referenced study are in-line with those found by Peltzer and colleagues (2011) in South Africa who likewise observed that binge, hazardous and harmful drinking peaks at between the ages of 20-34 years old (young adulthood). Given the age disparities amongst students in the study, Penny and Armstrong-Hallam (2010) concluded that younger students show increasing vulnerability to the use and abuse of alcohol. In this regard the authors asserted that universities have a role to play in awareness and preventative measures and should be held accountability for providing information of the detrimental effects of alcohol use and abuse (Penny & Armstrong-Hallam, 2010). Young and de Klerk (2008) who similarly observed the excessive drinking among first-time entering students in the study at Rhodes University as previously discussed echo these observations and similarly calls to university administration to act in response.

Notwithstanding Penny and Armstrong-Hallam's (2010) valuable findings that were in-line with results from other scholars such as Stewart and Moreno (2013) and Young and de Klerk (2008), the study does come with its own limitations. For example, the study had only focused on alcohol use and abuse and could therefore not produce a comprehensive coverage of the extent of substance abuse among university students. Moreover, it should also be noted that nearly half of the respondents in the study were between 18 and 20 years of age (47.9%), while 35.4% were 21-30 and the remaining 16.7% were 31 and over – which could very likely account for the recorded results in terms of age disparities between students.

A larger online study conducted by Lorant et al. (2013) in Belgium sent email invitations with a link to a web-survey questionnaire to all bachelor and master students registered with the university ( $N = 18,137$ ). Of the 18, 137 students, 7,015 students participated in the study (39%). This particular survey analysed alcohol consumption among college students from a community health perspective. In terms of students' substance use per age strata, this study found that older students participating in the study were less likely to drink and were even less likely to engage in abusive drinking. Furthermore, the findings showed that as the students' ages increased by a year, the frequency of abusing alcohol decreased by 9 percent and the frequency thereof decreased by 2 percent. Interestingly, the authors also found that the time spent at university had a double and mixed effect, i.e., although the older students surveyed drank less and less excessively than younger students; it also found that the longer a time a student spent studying at the university, the higher their risk of drinking (Lorant et al., 2013).

The two opposite effects explained above may explain why some studies have found no clear relationship between age and drinking behaviour (Wicki et al., 2010) as few studies have controlled for the time spent in college, so the maturing effect of age could be confounded by the risk associated with the time spent attending university. As such, the authors suggest that the results be approached with caution. As, for example, truancy could have affected the results, as younger students who did not proceed to graduate as a consequence of heavy alcohol consumption are less likely to be surveyed at a later stage. This makes comparison between younger and older students increasingly difficult, as the latter can only be observed if they have not dropped out of the University. In sum, the study's findings show that abusive drinking increased with the period attending the college, whereas it decreased with age.

The above studies reviewing age as a contributing factor for the use and abuse of substances presents opposing arguments regarding the difference between ages when it comes to substance use and abuse (alcohol consumption, in particular). With this in view, the literature was unable to demonstrate a clear association when considering age as a contributory factor when it comes to student's substance use and abuse (Lategan et al., 2017; Wicki et al., 2010). Notwithstanding the contrasting views, the majority of the authors in the respective studies agree that most students seem to abuse substance at the age when they join the university settings and that first-year students – who are often younger, are most at risk

for succumbing to substance abuse (NIDA, 2014; Penny & Armstrong-Hallam, 2010; Ruditis et al., 2015; White et al., 2005). The aforesaid findings could suggest that, if age is not a significant factor to consider in the use and abuse of substances among students, then perhaps there is something about the university environment and its impact it may have on students' psychosocial health. This said, it is recommended that age always be considered as an important determinant factor in the creation of effective awareness-, prevention- campaigns as well as intervention strategies at university level (Lorant et al., 2013; Penny & Armstrong-Hallam, 2010; Stewart & Moreno, 2013).

## **2.6. Substance Use and Mental Health**

Available literature show that mental health concerns and substance use problems are often interrelated (Kirst et al., 2011; Shafer et al., 2017). However, the degree to which the existing connection between mental health and substance use among the general public, and in particularly, university students is much less understood (Hudson et al., 2018). According to Becker et al. (2012) and NIDA (2014), mental conditions such as stress, anxiety, and depression are important factors predisposing students to use and subsequently abuse substances. However, many questions remain around which phenomenon causes the other. Such questions include whether substance use causes mental health problems, or whether mental health problems cause substance use. For example, some studies support the self-medication hypothesis in which it is hypothesised that students use substances because they find their depression and/or anxiety relieved by alcohol or other drugs (Kushner & Sher, 1993), while other researchers claim that substance abuse consequently leads to depression and/or anxiety (Deykin et al., 1987). In this regard, a third hypothesis has also been proffered in which it is suggested that depression and/or anxiety and substance use are related because both of them share common roots - either genetic factors or environmental factors, such as family dysfunction (Brook et al., 1998).

Although mental health is generally understood as an absence of a mental disorder, in this study a more comprehensive definition conceptualised by WHO (2013) will be considered. WHO (2013) defines mental health as “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” (WHO, 2013, p. 6). From this perspective, "self-regulation and coping theories of substance use indicate that individuals may engage in substance use behaviour because they believe it

can help them cope with negative life events and/or dysregulated emotional states" (Gonzalez et al., 2013, p. 2). Such hypotheses where substance use is associated with coping in order to deal with negative life events and/or emotional states is shared and corroborated by findings such as those carried out by Demery and colleagues (2012), who, in their study analysing the experiences of university students with a mood disorders, found that the university environment increases the chance of substance abuse through the exacerbating stress and tension students experience during this time.

The above findings were based on students' perception of the university as an upheaval experience. During their interviews, the authors found that students often admitted to succumbing to substance use and/or abuse in order to cope with different university pressures and demands as well as the accompanied negative feelings, such as stress and anxiety – which further induced or exacerbated their mental health problems (Demery et al., 2012). In this regard, the authors maintain that students' mental health problems could then further impede the concentration needed for academic purposes, which then, in turn, feed into the complex interaction between mental health and substance use, propelled by academic pressure (Demery et al., 2012).

In the same study, the authors also found that students who already present mental health problems prior to attending universities are at an even higher risk of experimenting with substances, as the new environment could exacerbate their already existing symptoms (Demery et al., 2012). Even though many of the findings concur with previous research in the field, it is also important to recognise the limitations of this study. Methodologically, it was an idiographic study where participants ( $n = 5$ ) required to have direct personal experience of a mood disorder, were recruited using a purposive approach via snowball sampling. Although this research design is valuable in terms of eliciting in-depth information about phenomenon, caution regarding generalisations of such findings should be noted.

In line with findings from Demery and colleagues (2012), Lin and Yussof (2013) similarly found that stress and other mental health conditions affect substance abuse among students as their study's findings indicated that many students use substances in order to cope with the pressures associated with the university environment. The findings of the study revealed that approximately 47.6% of the respondents suffered from psychological distress because of major stressors which were found to be academically related and negative coping methods, such as substance use were commonly used by the distressed respondents in an

attempt to cope with said stressors. It should, however, be noted that, the cross-sectional study carried out by Lin and Yussoff (2013), although useful, are based on data collected from high school students ( $N = 388$  students) where purposive sampling was adopted. As such, the findings from Lin and Yussoff (2013) may therefore, not be indicative of the plight of university students.

Albeit the findings were based on data emanating from high school students, such findings could be viewed as an indication of what is to be expected when students reach university levels as students in the study were considered 'pre-university' students aging from 18 to 19. It is also important to note that the collection of data was carried out close to the examination period, a period considered most stressful for students. This timing could have influenced the results found, as students are known to experience more feelings of stress during this time. Another important factor to consider when interpreting the results found by Lin and Yussoff (2013) is the Japanese culture, in which academic success is paramount for all adolescents. This can be seen from the participants' responses, of which the authors found that major stressors students reported were mainly related to academic matters – where the majority of students reported that they were "afraid of not getting university placement". In this regard, the authors conceded that students stress might possibly be because mere excellent result does not guarantee admission in desired courses in a local public university's in Japan (Lin & Yussoff, 2013).

Another study affirming such a connection was conducted by Atwoli and colleagues (2011) in Nigeria (a study previously discussed) who found that, of the students surveyed in their study, 60.8 percent of them reported to use substances in order to relieve feelings of being stressed. Maier et al. (2013) similarly found that students experiencing pressure such as academic work and family dysfunction were more likely to use substances. The link between substance use and mental health have also been identified in acculturation studies, such as those carried out by Chavez-Palacios et al. (2012), who found that Hispanic (Mexican-American) students at a university in the USA who consumed alcohol and other substances did so in order to cope with undergoing acculturation (Chavez-Palacios et al., 2012). In addition, Chavez-Palacios and colleagues (2012) also reported that approximately 44.1 percent of Hispanic respondents believed that marijuana use, and abuse is an effective coping mechanism for individuals who experience anxiety.

Another study contributing to the literature regarding the complex relationship between substance use and abuse and mental health was carried out by Kelly and Chan (2015), in which it was found that 27.21% of Australian students who were substance abusers were at risk of psychological distress (symptoms related to depression and anxiety) compared to only 11.39% in non-abusers. In contrast to previous findings supporting the relationship between substance use and abuse and students mental health, Goreishi and Shajari (2013), in their study on substance abuse among university students in Iran, found that the prevalence of substance abuse among students who presented no history of psychological disorder was more (33.2%) than in those with a known history of mental health problems (22.7%). The contrasting results presented by Goreishi and Shajari (2013) could, however, be because of the Iranian strict laws surrounding substance use. As substance abuse in Iran has many legal implications and, although the questionnaire was anonymous, fear of legal prohibition could have affected the students' responses, validity, and reliability of questionnaire.

In South Africa, there are very few studies looking at the mental health of students presented as a factor contributing to university students' substance use and/or abuse. Of the study's that have investigated this association present findings that reiterate international literature supporting such an association. For example, Peltzer et al., (2001) reported significant positive associations between heavy alcohol consumption and minor psychiatric morbidity (anxiety and depression as measured by the SRQ). The results are consistent with those of Sadava and Pak (1993) who conducted a study at a Canadian university and found a relationship between depression and alcohol-related problems among the students surveyed (Sadava & Pak, 1993). However, in this sample the researchers found no significant relationship between the depressive items of the SRQ and substance use (Sadava & Pak, 1993).

Although there are limited studies carried out in university settings regarding mental health and substance use, there have been a number of adolescent studies carried out at South African high schools. One such study was carried out by Panday and colleagues (2007), who found that depressive mood among youth often predicted smoking. In the preceding year, Fernander and colleagues (2006) also conducted a school-based study in Cape Town, which showed an association between tobacco use among female adolescents and depression, but interestingly not among the males in the sample. In a more recent study in South Africa, Brook and colleagues (2011) found a negative association between adolescents' well-being



and substance use. Similarly, Fernander et al. (2006) found a positive relationship between perceptions of lower well-being i.e. depression, low self-esteem, or poor general health with alcohol use and smoking.

In considering the previously mentioned literature concerning the association between student's mental health, and regardless of the debate whether substance use causes mental health problems, or whether mental health problems contribute to substance use and abuse among university students, there seems to be a clear indication that such an association does exist. Therefore, an investigation that could inform intervention programmes was paramount to explore and better understand substance use and abuse to prevent and/or control the problem through informed interventions.

To conclude the literature review, this chapter has explored global literature regarding the plight of substance use and abuse among university students. The prevalence and factors contributing to substance use and abuse were thoroughly discussed. As it was reported and from the summarised publications above, several studies documented that alcohol and substance abuse among university and college students is of global concern that needs due attention. The prevalence of substance use and abuse among university students in developing countries in Africa and elsewhere is almost similar to that of developed countries. The exception might be the prevalence of substance use among university students in more traditional African countries. This brings to the fore the situation of varied culture, diverse social, environmental and traditional practices which can make interpretation of results and recommendations from other regions difficult to generalise in diverse contexts such as South Africa.

Moreover, the reviewed literature has also made it apparent that most publications reviewed both globally and locally have not comprehensively explored the factors, associated problems and socio-demographic factors that need to be flagged out for policies and context specific strategies (interventions) particularly in South Africa. Of the studies that have been carried out in South Africa, very few are representative of the student population and most studies are passé. This paucity of information regarding substance use among university students in South Africa, specifically the Western Cape, can have serious implications on the success of any interventions aimed at reducing this problem. The importance of documenting this problem could therefore not be overstated.

## 2.7. Theoretical Framework

Bronfenbrenner's Ecological Systems Theory (EST), which serves as theoretical framework to interpret the factors associated with substance use among university students' South Africa, proposes that the environment within which an individual develops encircles him/her like "a set of nested structures, each inside the other like a set of Russian dolls" (Bronfenbrenner & Morris, 2007, p. 814). In this ecological theory Bronfenbrenner and Morris (2007) claims that in order to study human behaviour successfully, it is essential to understand that there is an interactive reciprocal relationship between the person and their environmental contexts (Bronfenbrenner et al., 2001). From this point of view, the EST framework suggests that a child's biological disposition combined with their environmental context and the interaction between these two components can influence their development (Paquette & Ryan, 2001). Proposing that the individual is at the epicentre of five major environmental contexts, defined as a network of systems. Bronfenbrenner (2005) proposes five such systems that play a fundamental role in shaping individual development namely, Micro-, Meso-, Exo-, Macro- and Chronosystems (Bronfenbrenner, 2005).

*Microsystem:* The system closest to the individual is defined as the microsystem, which is representative of the individual's immediate environment. This system consists of bi-directional relationships and interactions that a person has in their environment and focuses inter alia, on the family, neighbourhood/community, school, and peer group. Here the individual reciprocally interacts with others, and, in doing so, plays an active role in constructing their environments (Bronfenbrenner, 2005).

*Mesosystem:* This second system represents the linkages and interactions between two or more components in the microsystem, for example, the connections between family and school experiences, or between family and peers in which the individual is active (Bronfenbrenner, 1993; 2005). This can comprise of the connections between the child's teacher and parents together with the community (Paquette & Ryan, 2001). In this system, an individual's experiences in one microsystem can affect their experiences in another microsystem. For example, if a child is rejected by their parents, they might have difficulty developing positive relationships with teachers. As with the microsystem, here the individual plays an active role in constructing their environments (Bronfenbrenner, 2005).

*Exosystem:* The exosystem, is further removed from the individual, and consists of the broader social context in which the person does not function directly but nevertheless affects

his/her development indirectly (Bronfenbrenner, 1979; 2005). Components of the exosystem, which relates to the community, could, for example be the parents' place of work, family friends and neighbours (Bronfenbrenner, 1993) mass media as well as services available in the community (Swart & Pettipher, 2005), amongst others. Although the individual is not necessarily directly involved at this level, literature suggests that individuals nonetheless experience the residual effects thereof; which could either have a positive or negative effect on their development (Berk, 2000). For example, Van der Vorst and colleagues (2009) suggests that social factors such as unemployment and poverty in a given community may well influence problem behaviours such as substance abuse.

*Macrosystem:* Framing the exosystem, is the macrosystem. This system is the outermost system, referred to as the distinct 'societal blueprint', of a culture, or sub-culture (Bronfenbrenner, 1993). The components of the macrosystem's could therefore consist of a given society's ideologies, cultural values economic status and legislations (Swart & Pettipher, 2005). According to Germain (1991), this system has a cascading influence on all the other systems within this theory. As, for example, several policies and fiscal strategies adopted by a particular society has a direct impact on the individual as well as the different systems within the individual's life (Germain, 1991).

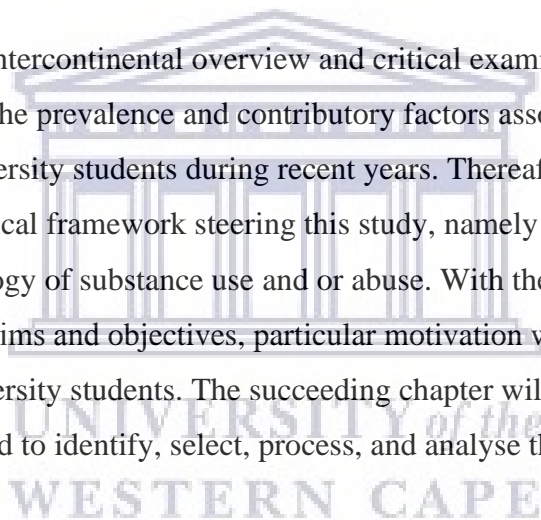
*Chronosystem:* Different to the micro- exo- and macrosystem that surrounds the individual at the centre of Bronfenbrenner's ecological model, the chronosystem does not resemble a system surrounding the individual. Instead, it can be referred to as a time-related system, which represents and encompasses change or consistency over time as it relates to an individual's environment (Bronfenbrenner, 1993). Which can represent transitions, or socio-historical conditions, which may affect an individual's development. Such as the timing of a parent's death (which can be considered external) or physiological changes that occur with aging (which can be considered internal) (Paquette & Ryan, 2001). Herewith maintaining that such changes may affect the child's development, for example, a parents' divorce and the disruptive effects thereof may coincide with an individual's entry into the adolescent life-stage, and may negatively affect their development (Bronfenbrenner, 2005).

The EST framework essentially proposes that all human growth and development takes place within the context of their relationships, during which their biological disposition, and environmental situation and context, all converge to shape (either help or hinder) their development. The decision to utilise the EST in this particular study primarily rests upon the

fact that it allows individuals to be studied and understood within a broader context (person-in-environment). This aligns to the context within which the study finds itself, i.e. the university student and the various settings they are exposed to. Since students do not live in isolation but rather within multifaceted structures, this approach was preferred as it acknowledges that the individual should be understood within their immediate settings, social networks and traditional communities established in a wider social structure (Adams et al., 2009). The ecological systems model has thus the potential to address substance use not only an individual level, but also at a community and institutional level. Furthermore, the EST has been recurrently endorsed and its application supported in research concerning substance use as it has proved effective in several studies done in this area of study (Bogg & Finn, 2009; Swick & Williams, 2006).

## **2.8. Chapter Summary**

This chapter provided an intercontinental overview and critical examination of relevant literature addressing both the prevalence and contributory factors associated with substance use and abuse among university students during recent years. Thereafter, a review of, and motivation for, the theoretical framework steering this study, namely EST, was tendered in an effort to explain the aetiology of substance use and or abuse. With the purpose of aligning the framework to the study's aims and objectives, particular motivation was provided for substance use among university students. The succeeding chapter will present and justify the research methods employed to identify, select, process, and analyse the information enclosed in this study.



## Chapter Three

### Method

The previous chapter has considered the literature relevant to this study. The ensuing chapter will discuss the research design, methods and types of analyses that were used to determine the prevalence and factors associated with substance use among university students.

#### 3.1. Research Context

There are 26 universities in South Africa (Universities South Africa, 2019). The population of the study consisted of registered students at one out of the four public universities in the Western Cape. The university was established in 1960 by the apartheid government as a higher education institution for individuals then classified as “coloured<sup>1</sup>” (University of the Western Cape [UWC]), 2013a). Post-1994 it was classified as a historically disadvantaged institution given the limited resources that the apartheid government had allocated to non-white institutions (O’Connell, 2011). The university has a history inspired by a struggle against oppression, discrimination and adversity (UWC, 2013a). Among institutions for higher learning in South Africa, the university in question has been in the front line of historical change, playing a pivotal role in the building of an equitable and dynamic South Africa (UWC, 2013a).

This study was originally initiated by the researcher’s observation of the behaviour of substance abuse among students at the target University during her course of study. Further motivation for the study developed following her discovery that very little is known about the current prevalence of substance use and abuse at universities in the Western Cape even though it is situated in the region where, according to the City of Cape Town’s (2013) Crime in Cape Town: Drug related 2003-2012 report, alcohol and drug use is four times higher than the average rate for the rest of South Africa. In addition, the reason for selecting the university was the fact that the university is situated within the region where the researcher resides which made it more accessible and convenient in terms of time and budget of the researcher. The university consists of seven faculties and four schools (UWC, 2013b). The faculty consists of Arts, Community and Health Sciences, Dentistry, Economic and

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<sup>1</sup> ‘Coloured’ was an official term used by the apartheid state to refer to a mixed-race group having Khoisan ancestry (Dinan, Mccal, & Gibson, 2004).

Management Sciences, Education, Law and Natural Science. The schools include Pharmacy, Government, Nursing and Science and Mathematics.

### **3.2. Research Design**

The research design is a framework or blueprint for conducting research, i.e. it is the conceptual structure, which guides the manner in which the research is conducted (Grove et al., 2013; Kothari, 2004). The quantitative methodological framework utilised here emphasises the quantification of constructs using variables that describe and evaluate human behaviour (Babbie & Mouton, 2001). The present study employed a quantitative approach using a cross-sectional survey design in order to provide an overview of substance use among students.

A survey design is a descriptive research method that is used for sampling data from respondents that are representative of a population (Byrne, 2002; De Vaus, 2014). This quantitative survey technique allows researchers to capture, describe, compare and provide information about certain behaviour, perceptions and knowledge at a particular point in time (De Vaus, 2014; Gray, 2013; Myers & Hansen, 2011). The use of a cross-sectional survey design in this research was guided by and is aligned with the study's aims, i.e. to establish the prevalence of and contributory factors associated with substance use among students at the university. In this respect, participants were required to answer research questions about self-reported drug and alcohol use, beliefs and behaviour. This allowed the researcher to describe, compare and gain a better understanding of the relationships between specific variables among the students (Myers & Hansen, 2006; Neuman, 2006).

### **3.3. Sample and Sampling Procedure**

The study's sample population included all registered students over the age of 18 years old from the seven faculties and four schools at the university. The study used the probability sampling technique to randomly select at least 10% of the student population in order to secure a representative sample of the university population (Peck & Short, 2018). This required recruiting 2522, 6 of the 25,226 registered students at the university.

Probability sampling is a procedure that assures that each member of a given population has equal chance of being selected for a study (Babbie, 2006). In this regard, probability sampling was employed to ensure that every student at the university had chance of being selected from the sampling frame (Creswell & Creswell, 2017). Therefore, all

registered students at the university ( $N = 25226$ ) received an email (as well as reminders) with a description of the study and the link to the survey. One advantage of using probability sampling is that sampling error can be calculated. Sampling error is the degree to which a sample might differ from the population. When inferring to the population, results are reported plus or minus the sampling error.

### Demographic Characteristics of the Sample

Table 1 presents the main demographic characteristics of the respondents, such as age, gender, and marital status, level of study, place of residences etc. Consistent with the findings presented in the literature review and the components of the Social Ecological Model, these demographic characteristics are important predisposing factors to consider in this use and abuse of substances.

Out of a total student population of 25226, 11.6% ( $N = 2915$ ) of students participated in the study. This percentage of students could be considered a representative subsample of the population.

**Table 1: Demographic Information of Participants**

		Count	%
Age	18-24	2164	74.2
	25-34	495	17.0
	35-44	172	5.9
	45-54	68	2.3
	55-64	6	0.2
	65-74	2	0.1
	>=75	0	0.0
	Missing	8	0.3
	Total	2915	100.0
Gender	Female	1863	63.9
	Male	990	34.0
	Non-binary/third gender	15	0.5
	I prefer not to answer	25	0.9
	I prefer to self-describe	8	0.3
	Missing	14	0.5
Total	2915	100.0	
Relationship status?	Single	1571	53.9
	In a relationship	1054	36.2
	Married	255	8.7
	Widowed	2	0.1

	Divorced	13	0.4
	Separated	9	0.3
	Missing	11	0.4
	Total	2915	100.0
Year of study	1st year	839	28.8
	2nd year	748	25.7
	3rd year	667	22.9
	Honours	327	11.2
	Masters	240	8.2
	PhD	66	2.3
	Missing	28	1.0
	Total	2915	100.0
	Faculty of registration	Arts and Humanities	646
Community and Health Sciences		299	10.3
Law		146	5.0
Education		206	7.1
Natural Science		415	14.2
Dentistry		72	2.5
Economic and Management Sciences		1013	34.8
School of Nursing		38	1.3
School of Pharmacy		26	0.9
School of Government		44	1.5
School of Science and Mathematics		4	0.1
Education			
Missing		6	0.2
Total		2915	100.0
Residence	University on-campus residence	387	13.3
	University off-campus residence	248	8.5
	Living at home with parents/family	1517	52.0
	Private accommodation	745	25.6
	Missing	18	0.6
	Total	2915	100.0
	Are you originally from the Western Cape?	Yes	1735
No, I moved here to attend university		521	17.9
No, my family relocated		82	2.8
If "no", where are you originally from?		566	19.4
Missing		11	0.4
Total		2915	100.0



The age of participants was recorded categorically, ranging from 18-24 years to 75 years and older. The majority of participants fell in the two youngest categories listed, i.e. 18-24 years [ $n = 2164$  (63.9 %)], and 25-34-year-old category (17%) respectively. In terms of the sample's gender orientation, the greater proportion (63.9%) identified as being female. This figure was followed by male respondents (34%) who made up just over half of the female respondents. The remainder of the respondents (1.7%) comprised of students either identifying as a non-binary/third gender, preferring not to answer the question or those of who preferred to self-describe. With reference to the sample's level of study, a large proportion of the participants indicated that they are 1<sup>st</sup> year (28.8%), 2<sup>nd</sup> year (25.7%) and 3<sup>rd</sup> year (22.9%) undergraduate students. The majority of the sample (34.8%) was from the Faculty of Economic and Management Sciences. This statistic was succeeded by the second largest grouping 22% of students who indicated that they were enrolled in the faculty of Arts and Humanities.

It is worth comparing the percentage per faculty response to the proportionate headcount per faculty captured in the latest annual report of the university under study (2018) which reads as follows: EMS 24.8%, Arts and Humanities 19.4%, Science 16.1%, CHS 15.6%, Education 11.0%, Law 9.8% and Dentistry 3.3%.

### **3.4. Data Collection Instruments**

The substance use questionnaire consisted of five different instruments namely, the demographic section, the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993), The Drug Use Disorders Identification Test (DUDIT; Berman et al., 2005), The Perceived Stress Scale (PSS-10; Cohen, Kamarck, & Mermelstein, 1983) and The Self-Reporting Questionnaire (SRQ-20; Harding et al., 1980). These scales will be discussed below and have been added as an appendix (C) for ease of reference.

#### ***3.4.1 Demographic Section***

A demographic section was developed in order to ascertain demographic information relevant to the current study's aims and objectives. In view of this, questions regarding the students' substance use, age, gender, education level, year level, marital status and onset of substance use were examined.

### **3.4.2 The Alcohol Use Disorders Identification Test (AUDIT)**

The Alcohol Use Disorders Identification Test (AUDIT) was employed to help screen, categorise and diagnose the incidence of safe, hazardous, harmful and dependent drinking among students (Appendix A). The AUDIT is a brief 10-item, 5-point Likert scale, self-administered questionnaire, with responses ranging from 0 (never) to 4 (4+ times per week). According to the AUDIT, an individual's extent of drinking is classified into four distinct categories (based on scores obtained from the scale which has a maximum score of 40). Scores ranging from 0-7 indicate "low-risk/safe drinking"; whereas scores between 8 and 15 are indicative of "drinking hazardously". Scores falling between 16 and 19 are categorised as being in the "harmful drinking" range. The highest category, as defined by the AUDIT, is that of individuals falling in the "alcohol dependent" category which consists of those who scored between 20 and 40 (Leedy & Ormrod, 2005).

The AUDIT has demonstrated a high degree of internal consistency, yielding a Cronbach's Alpha score of 0.83, with a range of 0.75 to 0.97 (Reinert & Allen, 2007). Furthermore, the AUDIT has been developed and validated by the World Health Organization (WHO) (Saunders et al., 1993) and various community and primary healthcare contexts within Southern Africa (Myer et al., 2008).

### **3.4.3 The Drug Use Disorders Identification Test (DUDIT)**

The DUDIT was employed in order to determine the extent of drug use among students. According to Berman and colleagues (2005), the DUDIT was developed using the AUDIT as a model to assist in the screening, diagnosing and categorising the severity of use of substances other than alcohol. In addition, this tool also measures psychosocial indicators of drug use.

The DUDIT is administered as an eleven item self-report questionnaire that uses a 5-point Likert scale to grade the responses ranging from 0 (never) to 4 (4+ times per week). The DUDIT categorises individuals into three broad categories of drug use. The first category classifies individuals as having "no drug related problems" (scores ranging from 0-5). The second category consists of scores falling within the range of 6-24, which is indicative of "harmful use or dependence". The last category (scores ranging from 25-40) categorises individuals as being "heavily dependent on drugs". The DUDIT was found to be a psychometrically sound instrument with high convergent validity ( $r = .85$ ) when compared to

similar measures such as the DAST-10 and has a Cronbach's alpha of .94 (Voluse et al., 2012).

#### **3.4.4 The Perceived Stress Scale (PSS-10)**

PSS-10 is one of the most extensively used instruments for measuring self-perceived stress on a scale from 0 (never) to 4 (very often) (Al kalaldehy & Abu Shosha, 2012; Cohen, 1994). In order to ascertain the stress students' experience during their time at university, the PSS-10 was utilised. The PSS-10 is a short, 10-item survey used to measure the level at which an individual appraises life events as unpredictable, overwhelming, or challenging. In this scale, items are rated on a 5-point Likert scale, ranging from 0 (never) to 4 (very often). Tallied PSS scores, which ranges from 0-40 are used to detect three categories of stress. An individual is considered to be experiencing low stress is their respective scores ranges from 0-13. Scores ranging from 14-26 suggests moderate stress while scores ranging from 27-40 would suggest high perceived stress (Cohen et al., 1983).

The PSS-10 includes questions such as, "In the last month, how often have you felt nervous and "stressed?"; "In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?" (Cohen et al., 1983). The PSS-10 has shown to have good internal and test-retest reliability ( $\alpha = .84-.86$ ) and it has demonstrated convergent validity with measures of anxiety, depression, and health, and divergent validity with measures of sensations-seeking, religious faith, and aggression among university students (Peltzer et al., 2002; Roberti et al., 2006).

#### **3.4.5 The Self-Reporting Questionnaire (SRQ-20)**

Developed by the World Health Organization (WHO), this questionnaire is a self-rating scale specifically designed to screen for psychological discomfort among individuals, particularly in developing countries. The SRQ-20 was therefore employed to assess the frequency and severity of 20 symptoms related to depression and anxiety among students. The SRQ has proven to be a valid (Cronbach's  $\alpha = 0.85$ ) (Stewart et al., 2009) and reasonably stable instrument in a several studies in different cultural contexts (Giang et al., 2006; Straton et al., 2014).

Both the PSS-10 and SRQ-20 are two of the most widely used instrument to measure perceived stress (Al kalaldehy & Abu Shosha, 2012; Cohen, 1994; Peltzer et al., 2002; Roberti et al., 2006) and psychological distress among populations in several different cultural contexts in and around South Africa (Giang et al., 2006; Straton et al., 2014).

### 3.5. Data Collection Procedures

Prior to the collection of data, the study followed and adhered to all the required ethics procedures set out by the Biomedical Research Ethics Committee (BMREC) of the university. Once ethics was approved from the BMREC, the Registrar's office of the university was approached in order to gain clearance and to access to all registered students email addresses. Once all of the participants were identified, the information sheet, consent form and substance use questionnaire (Appendix A-C), was administered online through SurveyMonkey for a period of two months. Scheduled reminders were also sent out to participants on a bi-weekly basis. It is worth noting here that the scheduled reminders sent out to participants increased the response rate significantly. Once data collection was completed, the data was exported, cleaned and analysed using the Statistical Package for the Social Sciences (v26.).

### 3.6. Data Analysis

The data analysis phase consisted of first cleaning and coding the raw data extracted from SurveyMonkey in Excel format. Thereafter, the Excel file was imported into the SPSS 26.0 software where the quality and accuracy of the data collected was examined by running frequencies on all of the items in the dataset and screening for missing data. This was carried out to verify whether the information in the Excel file corresponds to the original data captured via the online survey generated by SurveyMonkey. When items were flagged as being "problematic" and/or in error, the identified items were compared to the data in the original dataset (as per SurveyMonkey) and subsequently remedied (checked and corrected errors) before proceeding with the data analysis. For example, the verification process revealed quite a large number of missing data in both the AUDIT and DUDIT questionnaires. Once this discrepancy was identified, the primary researcher and data analyst discussed the possible implications that these omissions could have on the final analysis and interpretation of the data. After consultation with relevant literature (Berman et al., 2005; Myer et al., 2008; Verhoog et al., 2019; Voluse et al., 2012) and consideration of its effect on data analysis, it was decided that participants who had one or more missing values on either the AUDIT and DUDIT and for age, gender, and/or educational level would be excluded from the sample to be analysed.

The **first objective** of this study was to determine the prevalence of substance use among university students. In order to address this, respondents were labelled as "substance

users” if they had answered yes to question 12 (“Are you *still using* any of the substances mentioned above?”). Additionally, students were labelled as a “non-substance user” when they had indicated no substance use with respect to question 12. The “unsure” label was ascribed to students who said yes to question 12 which read “Are you still using any of the substances mentioned above?” but had not selected any of the substances in questions 10 and/or 11. The prevalence rates of substance use were identified through a frequency table (Table 2) which distinguished respondents as “substances users” or “non-substance users” *after* their enrolment at the respective university. To further investigate the prevalence rates of students’ substance use, the AUDIT and DUDIT were used to determine the severity of substance use according to the samples gender and age (Table 3, 4, 5 and 6).

A frequency table was produced (Table 7) to address the **second objective** of this research undertaking i.e. to determine the types of substances commonly used by students.

The Chi-square test for independence ( $\alpha = 0.05$ ) is often used when analysing associations between categorical variables from a single population (Field, 2018). Thus, it was used to address the first part of the **third objective** of this study. In this regard, this analysis set out to determine the association between categorical variables, age and gender (predictor variables) and how and/or if it related to students’ substance use after university enrolment (outcome variable).

Mann-Whitney U-tests were also conducted to ascertain the impact of perceived stress, depression and anxiety, because the predictor variables, the Perceived Stress Scale (PSS-10) and The Self-Reporting Questionnaire (SRQ-20) were measured on continuous scales. A *p*-value of less than 0.05 was determined to be statistically significant.

### **3.7. Ethics**

Ethics approval for the study was obtained from all the relevant committees at the university. These include the Community and Health Sciences Higher Degrees Committee, Biomedical Research Ethics Committee (BMREC registration number: BM18/9/1) as well as the Registrar of the university. In accordance with the ethics of psychological research (Sdorow & Rickabaugh, 2002); the following ethical guidelines were applied throughout this study:

### ***3.7.1. Informed Consent***

To ensure that participation was voluntary participants were provided with an information sheet (Appendix A) which outlined the purpose, aims and objectives of this study, the rights and responsibilities of the participants, as well as what it is that would be expected from them should they agree to take part in the research. This information was provided on the first page of the link sent via SurveyMonkey, which required participants to select either “yes” or “no” to give their consent to participate. If students chose to participate in the study, they could then click on the “next button” which allowed them to access and begin the questionnaire. The information sheet also highlighted the student’s right to voluntary participation and made it clear that the participant retained the right to withdraw from the study at any point without any consequences (in other words, non-participation or withdrawal at any point has no bearing on their studies). The processing and reporting of results were also clarified. Participants also then provided with an informed consent form to complete (Appendix B).

### ***3.7.2. Confidentiality and Anonymity***

Through the information sheet and consent forms participants were also guaranteed that what they disclosed to the researcher would remain confidential and used for research purposes only. This was ensured through not requiring any identifiable information from participants, thus maintaining their anonymity. In terms of ensuring the integrity and security of the collected data, participants were ensured via the information sheet that all surveys were stored on a password-protected computer and that all hard copy material was stored in a safe place, under lock and key, and were accessible to the researcher, supervisor and biostatistician only.

### ***3.7.3. Risk of Potential Harm to the Participants***

The participants in this study were provided with referral pathways (Appendix D), should the need for counselling services or emergency intervention arise as a result of their participation in this study. In this regard, it is important to note here that several students had sent individual emails to the researcher in which they offered their assistance in the study and/or required some advice and/or help. The referral pathways, therefore, proved valuable in being able to extend it to the students who expressed their need for assistance. Once referrals were given to individual students, the researcher continued to follow-up with the students to ensure that they had received the necessary help that they needed.

### **3.8. Chapter Summary**

In this chapter, the researcher outlined the research methodology utilised and attempted to demonstrate why it was the most appropriate approach to meet the aims and objectives of this study. Several steps involved in the design and development processes of the research were presented, described and explained. This includes the describing of the research context; providing justification for the utilisation of a quantitative cross-sectional survey design; data collection tools and the procedures followed to procure the sample under study. In a similar manner the data analysis methods used were outlined. The ensuing chapter provides the findings of the data analysis.



## Chapter Four

### Findings

#### 4.1. Introduction

While Chapter 3 presented the research approaches, designs, and methodologies followed in this study, the ensuing chapter presents the main findings of the study.

The ‘results’ of the study’ is divided into four sections. The first section of the study presents the prevalence of substance use among students (objective one). The second section reports on the types of substances used by students – thus, addressing objective two of the study. The third section presents the inferential statistics, which addresses objective three, i.e. to identify the factors associated with substance use among the sample.

#### 4.2. Findings of the Study

##### 4.2.1. Objective 1: Prevalence of Substance Use amongst Students

As previously reported in the *literature review*, it is suggested that institutions of higher learning will often be the first place for substance experimentation (Jaouahir et al., 2015). This perspective has been founded on the high proportion of studies that have designated university settings as being an environmental factor contributing to substance use and abuse among students globally (Arria et al., 2013; Bennett & Holloway, 2014; Jaouahir et al., 2015; Schulenberg et al., 2017; O’Malley & Johnston, 2002). For precisely this reason, the current study based students’ prevalence rates on questions explicitly enquiring *when* students used substances, i.e. before or after enrolling at university.

The prevalence rates of substance use among the sampled students are presented in the table on the next page (pg. 59, Table 2). The prevalence results presented was, as previously mentioned, based on the results obtained from one of the 14 questions in the demographic questionnaire. Therefore, for students to have been labelled as a “*substance user*” students had to have responded ‘yes’ to question 12, which read, “*Are you still using any of the substances mentioned above?*”). In order to be considered a “*non-substance user*”, students had to have indicated no substance use with respect to questions 12. Respondents were labelled “*unsure*” if they indicated ‘yes’ to question 12 but had not selected any of the substances in questions 10 and/or 11.



**Table 2: Substances Used while at University**

	Frequency	Valid Percent
Substance <b>user</b> after university enrolment	1827	62.7
<b>Non</b> -substance user after university enrolment	1084	37.2
Unsure	4	.1
<b>Total</b>	<b>2915</b>	<b>100.0</b>

*Note: The table above reports on the prevalence of the sampled students who indicated that they had used any one of the substances listed in the demographic questionnaire. Confidence interval: 62,68% [95% CI: 60,89, 64,43].*

The findings presented in Table 2 reveal that a clear majority of students 62.7% reported that they have used one or more of the substances listed in the questionnaire *after* they have enrolled at the respective university. Relative to the percentage of *non-substance users*, Table 2 demonstrate that out of the 2915 total students sampled, 37.2% indicated that they have not used any substance after enrolling at the university. Table 2 further presents the width of the CI, which indicates the precision of the point estimate. In this dataset, a narrow interval span of 60,89% to 64,43% can be observed among students with an odds ratio of 0.5, and a 95% confidence level. This is indicative of a relatively precise estimate of prevalence rate reported. Four students reported to be ‘unsure’ about their substance use and represents 0.1% of the sampled students.

In the interest of supplementing the data obtained from *Objective 1*, the AUDIT and DUDIT were used to help discover the level of alcohol and drug use among the sample of students who indicated current substance use ( $n = 1827$ ). The following analysis categorises students’ levels of alcohol and drug use according to their gender.

#### **4.2.2. Level of Alcohol and Drug Use among University Students (AUDIT and DUDIT)**

The Alcohol Use Disorder Identification Test (AUDIT) and the Drug Use Disorder Identification Test (DUDIT) was developed as models to assist in the screening, diagnosing and categorising of the level of alcohol and drug use (WHO, 2001). These scales or ‘tests’ were used in the present study to help ascertain the extent of alcohol and drug use of students. The following analysis also categorises the extent of alcohol and drug use according to students’ gender.

### *Level of Alcohol Use (AUDIT) and Gender*

University students' gender has often been identified as an important factor to consider in the understanding, development and management of tailor-made substance use prevention, awareness and intervention campaigns. Since a large share of research discussed in the literature review identified males as consuming more substances than their female counterparts (Becker et al., 2012; Center for Behavioural Health Statistics and Quality, 2016; Kanyoni, 2015; Kyei & Ramagoma, 2013; Meyer, 2011; Reddy et al., 2003; Verhagen et al., 2015; Young & De Klerk, 2008), the following analysis seeks to determine whether the same could be observed in a sample of students in a South African university. It is noteworthy that even though empirical evidence affirms that gender is a non-binary spectrum, the dominant discourse of gender still assumes that gender comprises only of two categories: female and male (Hyde et al., 2019). This overreliance on binary measures of gender in research, especially psychological research, infringes on our discipline's ethical principles of avoiding harm, protecting participants' integrity, and giving them respect.

In attempts to avoid gender misclassification and evoke gender inclusivity in future research, this research paper sets out to explore gender on a non-binary spectrum. That which follows presents a description of the level of alcohol use according to students' gender orientation.

**Table 3: Cross-tabulation of AUDIT scores and Gender**

		Gender					Total	
		Female	Male	Non-binary/ third gender	I prefer not to answer	I prefer to self- describe	Missing	
Total	Low risk AUDIT score				7 (63.6%)	3 (50%)	4 (0.3%)	819 (70.4%)
	Hazardous drinking	548 (76.1%)	254 (61.5%)	3 (37.5%)	1 (9.1%)	2 (33.3%)	1(0.1%)	269 (23.1%)
	Harmful drinking	137 (19%)	126 (30.5%)	2 (63.6%)	2(18.2%)	0	0	37 (3.2%)
	Alcohol dependence	18 (2.5%)	16 (3.9%)	1(12.5%)	1(19.1%)	1 (16.7%)	1 (0.1%)	39(3.3%)
Total		720(61. 9%)	413(35.5%)	8(0.7%)	11(0.9%)	6(0.5%)	6(0.5%)	<b>1164 (63.7%)</b>

The above table (Table 3) shows the extent of alcohol use for those who were identified as a ‘substance user’ after university enrolment ( $N = 1827$ ) according to their preferred gender orientation. Based on the subset of the population ( $N = 1827$ ), a total of 1164 (63.7%) students completed the AUDIT questionnaire. The analysis in Table 3 reveals that the majority of students (70.4%) reported ‘low-risk drinking’ while ‘harmful drinking’ and ‘alcohol dependency’ was reported by 3.2% (or 37 students) and 3.3% (or 39 students) respectively. In terms of gender disparity, there appears to be more females than males who reported ‘low-risk’ or ‘safer’ drinking. When tabulating the proportion of ‘hazardous’, ‘harmful’ and ‘dependent’ drinking (problematic drinking), males (38.5%) reported more problematic drinking in relation to females (23.9%).

### *Level of Drug Use and Gender*

The results of the students’ level of drug use according to their gender orientation are presented in the ensuing table.

**Table 4: Cross-tabulation of DUDIT scores and Gender**

		Gender						
		Female	Male	Non-binary/third gender	prefer not to answer	I prefer to self-describe	Missing	Total
Total DUDIT score	No drug-related problems	831(90.5%)	392(81.7%)	5(62.5%)	10(77%)	3(60%)	7(0.5%)	1248(87.1%)
	Harmful use or dependence	83(9%)	81(16.9%)	2(25%)	3(23%)	2(40%)	1(0.1%)	172(12.0%)
	Heavily dependent on drugs	4(0.5%)	7(1.4%)	1(12.5%)	0	0	0	12(0.9%)
<b>Total</b>		<b>918(64.3%)</b>	<b>480(33.7%)</b>	<b>8(0.4%)</b>	<b>13(0.8%)</b>	<b>5(0.3%)</b>	<b>8(0.5%)</b>	<b>1432(77.6%)</b>

The cross-tabulation of respondents’ DUDIT scores with respect to their gender orientation is displayed above (Table 4). Table 4 reveals that, overall, the majority of respondents (87.1%) reported ‘no drug-related problems’ while 12.0% or 172 students reported ‘harmful use or dependence’. The minority of respondents’ DUDIT scores suggests that 0.9% of the

population were ‘heavily dependent’ on drugs. Males (18.3%) ‘harmful’ and ‘dependent’ drug use (problematic drug use) ratio is double that of women females (9.5%).

#### 4.2.3. Objective 2: Describe the Types of Substances that are Commonly Used

The second objective of this study was to identify the types of substances commonly used by university students. This objective was borne out of the observation made in the literature review wherein many studies paid very little attention to other types of substances used by students apart from alcohol (Becker et al., 2012; Center for Behavioural Health Statistics and Quality, 2016; Kanyoni, 2015). This gap in the research, noted previously, was deemed essential in any effort to create effective awareness-, prevention- campaigns as well as targeted intervention strategies for the population. The frequencies in Table 5 below was conducted on the total number of participants in the sample ( $N = 1827$ ).

**Table 5: Cross-tabulation of Types of Substances Used and Gender**

	Gender				Self-		Total
	Female	Male	Non-binary	No answer	describe	Missing	
Prescription or non-prescription medication	59	20	4	2	0	0	85(4.6%)
Alcohol	947	487	9	13	6	10	1472(80.6%)
Cannabis	526	297	4	9	1	4	841(46%)
Meth		6	0	1	0	1	14(0.8%)
Buttons	2	3	0	0	0	1	6(0.3%)
Unga	0	1	0	0	0	0	1(0.05%)
Ecstasy	58	35	1	2	0	0	96(5.3%)
Other	83	55	2	1	4	1	146(8%)
<b>Total</b>	<b>1173</b>	<b>609</b>	<b>11</b>	<b>17</b>	<b>7</b>	<b>10</b>	<b>1827</b>

Table 5 displays a list of different substances reported as being commonly used by students. In this regard, alcohol appeared to be the most used substance among students as 80.6% of respondents indicated that they have used alcohol after their enrolment at the respective university ( $n = 1472$ ). The second-most used substance reported by respondents is cannabis, which is commonly known in the Western Cape as ‘dagga’ or weed. The percentage of students reporting cannabis use amounts to 46% ( $n = 841$ ) of the sampled respondents.

The third largest proportion of students (96 students or 5.3%) indicated that they used ecstasy. Table 5 further reveals that 8% of the students identified the use of substances not explicitly mentioned in the questionnaire, for example, Ritalin ( $n = 33$ ) Poppers ( $n = 32$ ), Ketamine ( $n = 31$ ), Mescaline ( $n = 30$ ), other over-the-counter-medicine ( $n = 28$ ), Dimethyltryptamine (DMT or N) ( $n = 27$ ), Xanax ( $n = 26$ ), Vape ( $n = 25$ ) Traditional beer ( $n = 24$ ), Pethidine ( $n = 21$ ) Tramadol ( $n = 20$ ), Rock ( $n = 19$ ), Hookah ( $n = 18$ ), Flakka ( $n = 17$ ), CAT ( $n = 16$ ) MD ( $n = 15$ ), MDMA ( $n = 14$ ), Acid ( $n = 10$ ) LSD ( $n = 12$ ) Mushrooms ( $n = 13$ ) and Cocaine ( $n = 11$ ).

#### **4.2.4. Objective 3: Identify the Factors Associated with Substance Use among the Students**

Existing literature has identified **gender** (Beck et al., 2014; Becker et al., 2012; Jain, 2013; Lemelin et al., 2014; Kanyoni, 2015; Kyei & Ramagoma, 2013; Meyer, 2011; Reddy et al., 2003; Verhagen et al., 2015; Young & De Klerk, 2008), **age** (Bewick et al., 2008; Schulenberg et al., 2017; NIDA, 2014; Peltzer et al., 2011; White et al., 2005), **mental health** (Becker et al., 2012; Demery et al., 2012; Chavez-Palacios et al., 2012; Kelly & Chan, 2015; Lin & Yussuff, 2013; NIDA, 2014; Peltzer et al., 2001) as well as the **university environment** (Adekeye et al., 2015; Arria et al., 2013; Atwoli et al., 2011; Bennett & Holloway, 2014; Francis et al., 2014; Jaouahir et al., 2015; Schulenberg et al., 2017; Kalsi, 2015; O'Malley & Johnston, 2002; Weitzman et al., 2003) as being factors closely associated with student substance use worldwide. *Objective 3* thus seeks to determine whether these variables are in any way associated with substance use among a previously underexplored population of university students in the Western Cape.

##### **4.2.4.1. Gender of Respondents**

University students' gender has been identified as an important factor to consider in distinguishing those who use substances from those who do not use substances after enrolment. Most of the literature reviewed revealed a rather consistent difference between genders when it comes to substance use, in particular, alcohol use. In this regard males have been identified as consuming more substances than their female counterparts (Becker et al., 2012; Center for Behavioural Health Statistics and Quality, 2016; Kanyoni, 2015; Kyei & Ramagoma, 2013; Meyer, 2011; Reddy et al., 2003; Verhagen et al., 2015; Young & De Klerk, 2008). In an attempt to ascertain if a similar trend is evident in South Africa, and to expand on the results presented in *Objective 1*, Table 6 (overleaf) displays the Chi-square of

independence test which assessed whether there were significant differences between the gender orientation of students and substance users and non-users.

**Table 6: Chi-Square test: Gender and Substance Use at University**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	<b>4.304<sup>a</sup></b>	5	<b>.507</b>
Likelihood Ratio	4.735	5	.449
Linear-by-Linear Association	.473	1	.492
N of Valid Cases	2911		

a. 1 cells (8.3%) have expected count less than 5. The minimum expected count is 2.98.

The table above (Table 6) demonstrates the results of the Chi-square of independence test that was conducted to assess whether there were significant differences between *substance users* and *nonsubstances users post university enrolment* in relation to the recorded *gender categories* of the sampled respondents. From this point of view, Table 6 demonstrates that substance use is independent from students' disclosed gender orientation ( $\chi^2(5) = 4.304$ ,  $p > 0.05$ ). This confirms that there is no statistically significant association between those who choose to use substances in relation to their identified gender.

#### 4.2.4.2 Age of Respondents

As previously mentioned in the literature review of this study, there are opposing arguments regarding whether or not there is an association between students' age and their respective substance use (NIDA, 2014; Penny & Armstrong-Hallam, 2010; Roditis et al., 2015; White et al., 2005). Table 7 (below) demonstrates the results of the Chi-square of independence test that was conducted to assess whether there were significant differences between *substance users* and *nonsubstances users post university enrolment* in relation to *age categories* of the respondents.

**Table 7: Chi-Square: Age and Substance Use at University**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	<b>6.028<sup>a</sup></b>	6	<b>.420</b>
Likelihood Ratio	6.779	6	.342

Linear-by-Linear Association	.000	1	1.000
N of Valid Cases	2911		

a. 5 cells (35.7%) have expected count less than 5. The minimum expected count is .74.

Based on the sampled students' responses, it could be inferred that there is not enough evidence to suggest an association between age and substance users and non-users ( $\chi^2 = 6.03$ ,  $p > 0.05$ ).

#### 4.2.4.3. The University Environment

Past literature has identified the university setting as being a crucial environmental factor contributing to substance use and abuse among students across the globe. From this point of view, research suggests that some conditions must exist within the environment of higher education settings that makes students more susceptible to the use and/or abuse substances (Arria et al., 2013; Bennett & Holloway, 2014; Jaouahir et al., 2015; Schulenberg et al., 2017; O'Malley & Johnston, 2002). In some instances, it is often described as being the time representing an unparalleled period in which young adults succumb to the use of substances (Schulenberg & Maggs, 2002). Although, it should be recalled here that such observations have been made by researchers investigating university students residing in first-world countries such as the United States of America and the United Kingdom (UK) (Arria et al., 2013; Bennett & Holloway, 2014; Schulenberg et al., 2017; Kalsi, 2015; O'Malley & Johnston, 2002; Weitzman et al., 2003), and such results can thus not be used as comparison findings for third-world countries, such as South Africa. The researcher deemed it essential to determine whether students from a university in South Africa have the same experience. Although, the results of the study do not claim to be representative of all universities in South Africa, it aims to provide at least some indication of the situation with respect to university students in third-world countries, such as South Africa.

A Chi-square of independence test (Table 8) was carried out to ascertain whether there were significant differences between student's substance use before and after their university enrolment. This was done in order to determine whether there was an association between university enrolment and students' substance use.

**Table 8 Chi-Square Test: Substance Use before and after University Enrolment**

	Value	Exact Sig. (2-sided)
McNemar Test		.000 <sup>a</sup>

a. Binomial distribution used.

The results in Table 8 (above) indicate that there is a significant, negative association between the university environment and student substance use ( $p < 0.05$ ), as it demonstrated that, overall, there was a reduction in substance users after being exposed to the university environment.

#### 4.2.4.4. Mental Health: SRQ-25 and PSS-10 Results

The reviewed literature on the mental health of university students and its likely association with substance use and or abuse presented a compelling debate between researchers who postulate that substance use influences mental health problems, and those who postulate that mental health problems contribute to substance use and abuse among university students. Nonetheless, both debates converge on one common view, which is, that irrespective of the direction of the association, there appears to be a definite indication that such an association between the substance use and students' mental health does exist (Becker et al, 2012; NIDA, 2014; Shafer et al., 2017).

The following section presents the results of the Mann-Whitney U-tests to determine the association with students' self-reported mental health and their use of substances.

**Mental Health: Self-Report Questionnaire-25.** Table 9, below, presents the results of students' responses to the SRQ-25 questionnaire which assessed the frequency and severity of 20 symptoms related to depression and anxiety on a 0 (absent) to 1 (present) scale. A cut off score of 7/8 is used to indicate the presence of depression and anxiety. The data presented in Table 11 shows some evidence that there is a significant association ( $p = .001$ ) between being a substance user and non-substance user and students respective SRQ scores. The results indicated that students who scored higher in the SRQ-25 were students who reported substance use at university. Figure 1 and 2 further reveals a mean score of 7.42, which, according to literature, corresponds to the cut off score of 7/8 which is used to indicate the presence of depression and anxiety. This indicates that the majority of students in the sample self-reported clinically significant presence of depression and anxiety, according to the SRQ-25.



**Table 9: SRQ-25 Scores across Substance Users and Non-Substance Users Independent-Samples Mann-Whitney U Test Summary**

Total N	2097
Mann-Whitney U	467533.000
Wilcoxon W	767458.000
Test Statistic	467533.000
Standard Error	13356.488
Standardized Test Statistic	-3.329
Asymptotic Sig. (2-sided test)	<b>.001</b>

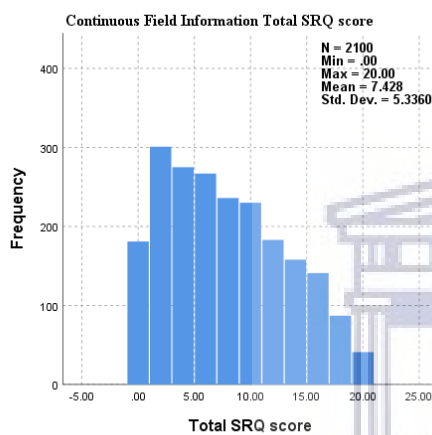


Figure 1

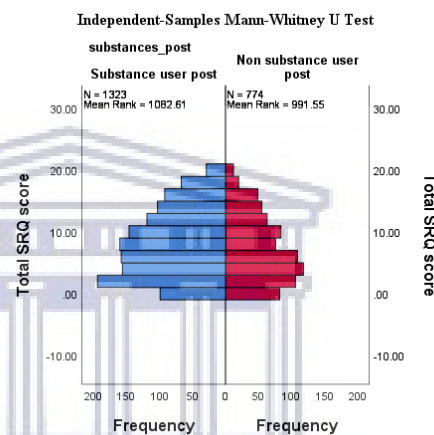


Figure 2

The results found in Table 9 and Figures 1 and 2 reveals a significant association ( $p < .01$ ) between being a substance user and non-substance user and students' respective SRQ scores.

**Mental Health: Perceived Stress Scale-10 Results.** To ascertain the levels of stress students' experience during their time at university, the PSS-10 was administered and analysed. The PSS-10 measures the level at which respondents appraise life events as being unpredictable, overwhelming, or challenging. Individual scores on the PSS range from 0 to 40, with higher scores indicating higher perceived stress. Individuals whose scores range between 0-13 are perceived to have low stress. Scores ranging from 14-26 would be considered as having moderate stress. The final category of scores, i.e. ranging from 27-40 would be indicative of individuals having high perceived stress. It is within this context that respondents were scored, and findings were analysed using the Mann-Whitney U test for analysis.

**Table 10: PSS-10 Results: Independent-Samples Mann-Whitney U Test Summary**

Total N	2230
Mann-Whitney U	560076.000
Wilcoxon W	895047.000
Test Statistic	560076.000
Standard Error	14617.221
Standardized Test Statistic	-1.193
Asymptotic Sig.(2-sided test)	<b>.233</b>

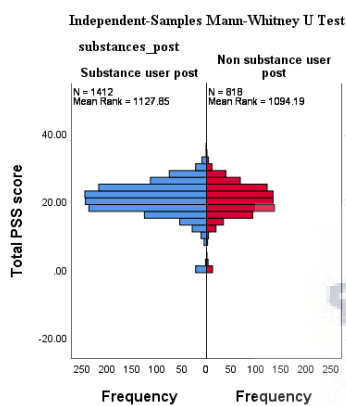


Figure 3

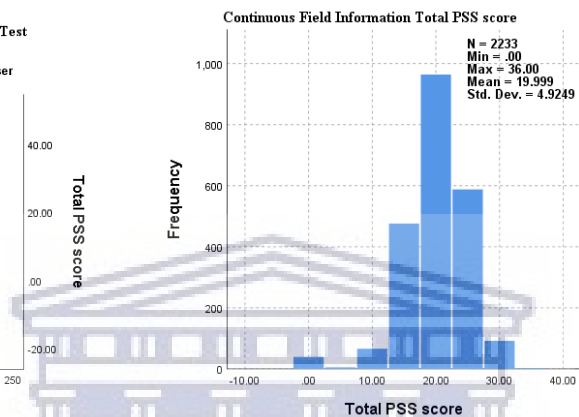


Figure 4

Results presented in Table 10 demonstrates that there is no significant association ( $p > 0.05$ ) between being a substance user and nonsubstance user post university enrolment and students respective PSS-10 scores. Figures 3 and 4 furthermore supports and expands on the results found in Table 11 by showing how scores cluster around the 19/20 mark in both of the groups. In terms of students' level of stress, the results from Figures 3 and 4 furthermore indicate that the majority of students in both groups fall within the moderate stress levels as per PSS-10.

#### 4.4. Conclusion

In this chapter the findings from the research study were presented in unison with, and in reference to, the research objectives set out in beginning of the study. More specifically, this chapter provided the prevalence of substance use, the types of substances most commonly used and the factors associated with substance use among university students at the respective university.

## Chapter Five

### Discussion

#### 5.1. Introduction

The following chapter presents a discussion of the findings of the study. The ecological systems theory is used as a lens to interpret the results in order to provide a framework for prevention, with a primary focus on the Microsystem of the EST (as this is representative of the individual and his/her immediate social domains).

#### 5.2. Discussion of Results of the Study

##### 5.2.1. Objective 1: Prevalence of Substance Use amongst Students

The analysis presented in the preceding chapter revealed that more students (62.7%) reported that they have used substances *after* university enrolment than those who indicated that they have not used any substance after enrolling at the university (37.2%). The prevalence rates found in this study appear to align with most mainstream findings which, similarly, found high substance use rates after students had enrolled at their respective university/college (Arria et al., 2013; Bennett & Holloway, 2014; Jaouahir et al., 2015; O'Malley & Johnston, 2002; Schulenberg et al., 2017).

In the interest of supplementing the data obtained from *Objective 1*, the AUDIT and DUDIT were used to ascertain the level of alcohol and drug use among the sample of students who indicated that they were current substance users ( $n = 1827$ ).

The analysis also revealed that the majority of students reported 'low-risk drinking' while 'harmful drinking' and 'alcohol dependency' combined were reported by the minority (6.5%). In terms of gender disparity, there appeared to be double the number of males who reported 'hazardous', 'harmful' and 'dependent' drinking (problematic drinking) than when compared to females. In a similar vein, results from the DUDIT revealed that the majority of respondents reported 'no drug-related problems' while males reported double the amount of 'harmful' and 'dependent' drug use (problematic drug use) than when compared to females).

The results above concur with a number of international studies which found that males are more likely than females to engage in substance use and abuse (Becker et al., 2012; Center for Behavioral Health Statistics and Quality, 2016; Sorsdahl et al., 2012; Webster et al., 2014). The results particularly reflect those of universities found in South Africa where

students also showed large gender-based variation when it came to using substances (Reddy et al., 2003; Young & De Klerk, 2008).

### **5.2.3. Objective 2: Describe the Types of Substances that are Commonly Used**

The most commonly reported substance used was alcohol. This is followed by cannabis use. It should be noted here that although cannabis accounts for less than 50% use among the sample, this percentage appears to be considerably higher when compared to other studies in similar contexts (Peltzer et al., 2002; Pengpid et al., 2013). This increase could, of course, be as a result of the recent decriminalisation of the private use of cannabis in South Africa (Lubaale & Mavundla, 2019).

The third largest proportion of students indicated that they used ecstasy. This observation is noteworthy as it appears to contrast previous research which demarcates the population of the Western Cape province as having the highest number of methamphetamine users when compared to the rest of South Africa (Dada et al., 2017). For example, Dada and colleagues (2017) found that, on average, methamphetamine or “Tik” remained the primary substance of abuse among patients (27%) in the Western Cape followed by cannabis (26%) and alcohol (24%). The findings also revealed that 8% of the students identified the use of substances not explicitly mentioned in the questionnaire. Important to note here is that the number of “other” substances evidently surpasses commonly well-known and well-documented substances in South Africa, such as Ecstasy ( $n = 96$ ), Methamphetamine ( $n = 14$ ), Buttons ( $n = 6$ ) and Unga ( $n = 1$ ). This noteworthy and rather unanticipated finding could be indicative of a gradual paradigm shift in the types of substances commonly reported/used by university students at this point in time.

As previously mentioned, it is unfortunate that this observation could not be duly compared to corresponding samples of students in and around the Western Cape as most available literature focuses primarily on alcohol and/or cannabis use and/or abuse. It is, therefore, hoped that the findings could likely serve as baseline information in respect of identifying the present types of substances commonly reported/used by university students in and around the Western Cape and/or it could be indicative of a call for a shift in focus for future research carried out in similar contexts.

This being said, it is, however, quite important to view the findings relating to “other” substances as it pertains to the broader population (Western Cape) within which the study

population resides in order to ascertain to which extent (if any) this population differs from the rest of the population within the Western Cape.

Neoteric findings produced by the South African Community Epidemiology Network on Drug Use (SACENDU, 2019) report that the Western Cape province of South Africa (SA) has the highest use of methamphetamine than any other province in the country (Dada et al., 2017). On average, the authors found that methamphetamine remained the primary substance of abuse among patients (27%) followed by cannabis (26%) and alcohol (24%). These figures, should, of course be interpreted as an unrepresentative portion of the population as most substance users do not report for, or have access to, treatment facilities all together (Dada et al., 2019). Nonetheless, the aforesaid reports are, of the most relied upon statistics concerning substance use in South Africa. These results (which are based on a relatively similar age grouping) do, as can be inferred, contrast to those found in the results of this research endeavour. These contrasting outcomes are a promising indication that different subsets of populations require more contextually based approaches, which uniquely targets the individual within their immediate environment.

#### **5.2.4. Objective 3: Identify the Factors Associated with Substance Use among the Students**

##### **5.2.4.1. Gender of Respondents**

The analysis confirmed that there is no statistically significant association between students' gender and their substance use. The results are in contrast to numerous studies which conclude that males are more likely than females to engage in substance use and abuse (Becker et al., 2012; Center for Behavioural Health Statistics and Quality, 2016; Sorsdahl et al., 2012; Webster et al., 2014; Verhagen et al., 2015; Young & De Klerk, 2008). In South Africa, research has categorically reported a strong relationship between sex/gender and alcohol use in particular (Kyei & Ramagoma, 2013; Young & Mayson, 2010). This potentially discrepant finding could, however, be indicative of a possible paradigm shift in the current trend of substance use in terms of individual's gender orientation. Since many of the literature reviewed in South Africa were rather dated and purely focused on the use and abuse of alcohol.

#### 5.2.4.2 Age of Respondents

There was not enough evidence to suggest an association between age and substance users and non-users ( $\chi^2 = 6.03, p > 0.05$ ). The results appear to contradict the majority of findings found in the *literature review* of this study which concluded that most students seem to use and/or abuse substances at the age when they first enter the university settings, i.e. they are often younger, are most at risk for succumbing to substance abuse (NIDA, 2014; Penny & Armstrong-Hallam, 2010; Roditis et al., 2015; White et al., 2005; Young & de Klerk, 2008). This being said, the results of the analysis does reiterate and somewhat mirror those of a relatively recent study carried out at Stellenbosch University in the Western Cape wherein Lategan and colleagues (2017), were likewise unable to demonstrate a clear association between the sampled students age and their respective substance use/non-use (Lategan et al., 2017).

Although the analysis was not necessarily significant, the descriptive Table 6, shows that the majority of students who use substances are within the age range 18-24 years. In considering both the current studies results and those of which have been discussed throughout, there seems to be considerable heterogeneity among the different results which could be a result of numerous unknown reasons, but what the literature does reach an agreement on is that more research, specifically in South Africa, needs to be carried out to test such associations.

#### 5.2.4.3. The University Environment

A Chi-square of independence test was carried out to ascertain whether there were significant differences between student's substance use before and after their university enrolment. This was done in order to determine whether there was an association between university enrolment and students' substance use.

The results indicate that there is a significant, negative association between the university environment and student substance use ( $p < 0.05$ ), as it demonstrated that, overall, there was a reduction in substance users after being exposed to the university environment. Interestingly, this finding challenges the widespread global consensus that, university students were, not only more at risk for substance use after enrolling at universities (Karama et al., 2007; Johnston, 2017; Francis et al., 2014) but that the majority of university students, including those who have never tried substances, initiated use after enrolment (Arria et al., 2013; Schulenberg et al., 2017; O'Malley & Johnston, 2002).

In essence, the above studies (Arria et al., 2013; Francis et al., 2014; Karama et al., 2007; Johnston et al., 2017; O'Malley & Johnston, 2002) have concluded that the majority of sampled university students, including those who have never tried substances, initiated use after enrolment. Thereby illustrating that sampled students who entered university not only reported novice use but that they had also increased their usage after their enrolment at the respective universities. This being said, much more research of similar nature needs to be conducted in South Africa to adequately compare this study's results to relatively well-documented populations of students, such as those mentioned above (Arria et al., 2013; Schulenberg et al., 2017; O'Malley & Johnston, 2002). Parallel to such an observation, is the matter of differences in both context and socio-economic circumstances of the respective students at the different universities.

#### **5.2.4.4. Mental Health: SRQ-25 and PSS-10 Results**

The reviewed literature on the mental health of university students and its likely association with substance use and or abuse presented a compelling debate between researchers who postulate that substance use influences mental health problems, and those who postulate that mental health problems contribute to substance use and abuse among university students. Nonetheless, both debates converge on one common view, which is, that irrespective of the direction of the association, there appears to be a definite indication that such an association between the substance use and students' mental health does exist (Becker et al., 2012; NIDA, 2014; Shafer et al., 2017).

The following section presents the results of the Mann-Whitney U-tests to determine the association with students' self-reported mental health and their use of substances.

**Mental Health: Self-Report Questionnaire-25.** Research has shown that university students are more prone to depression, anxiety and stress than comparable populations (Bunevicius et al., 2008; Mahajan, 2010). The SRQ-25 has been identified as one of the most reliable instruments to assess students' psychological distress, especially in and around South Africa (Giang et al., 2006; Straton et al., 2014). The results found in Table 9 and Figures 1 and 2 reveals a significant association ( $p < .01$ ) between being a substance user and non-substance user and students' respective SRQ scores. These results appear to be in consensus with much of the available literature which interchangeably associates some aspect of mental health with substance among university students (Becker et al., 2012; NIDA, 2014; Shafer et al., 2017). However, although valuable, the results presented is likewise unable to support or refute the

three main hypotheses offered in the literature review which varied from conclusions relating to whether substance use leads to mental health problems (Deykin et al., 1987); whether mental health problems cause substance (Kushner & Sher, 1993) or whether these concepts are so closely related that it could not be studied in isolation (Brook et al., 1998).

It is likewise unfortunate that, as with the limitations found in Demery et al., 2012, the presented results were unable to answer the question as to whether students who already present mental health problems prior to attending universities are at an even higher risk of experimenting with substances, as the new environment could exacerbate their already existing symptoms (Demery et al., 2012). What it does however show, is that there appears to be a significant difference between the two groups in terms of their mental health and use of substances, i.e. students who identified as non-users reported less symptoms of anxiety and depression (according to the SRQ-25) than students who indicated that they were substances users. Which is indicative of there being some validity to the claims concerning the complex relationship between substance use and mental health, particularly among university students.

**Mental Health: Perceived Stress Scale-10 Results.** This study used the PSS-10 to measure psychological stress among students mainly because it defines stress as an interaction between environmental demands and the individual's capacity to cope (Cohen et al., 1983). Results presented in Table 10 demonstrates that there is no significant association ( $p > 0.05$ ) between being a substance user and nonsubstance user post university enrolment and students respective PSS-10 scores. Figures 3 and 4 furthermore supports and expands on the results found in Table 11 by showing how scores cluster around the 19/20 mark in both of the groups. In terms of students' level of stress, the results from Figures 3 and 4 furthermore indicate that the majority of students in both groups fall within the moderate stress levels as per PSS-10.

These results found above are in contrast with a plethora of studies which found significant associations between respondents who suffered from psychological distress and their use of substance use. Substance use was commonly reported as being used by the distressed respondents in an attempt to cope with academic pressures and demands (Demery et al., 2012; Lin & Yussoff, 2013).

### **5.3. The Ecological Systems Theory: A Framework for Prevention**

The primary objective of most studies involving substance use and/or abuse is to foster prevention and to inform current and future awareness and intervention efforts in order to



avoid the detrimental effects of substance use (Beck et al., 2014; White et al., 2005; Young & De Klerk, 2012). This being said, such an objective could only be realised through revolutionised evidence-based research where efforts to operationalise multi-disciplinary efforts to address substance use and abuse are put into policy to enable people working at the coalface to deliver those policies.

Research has shown that it is beneficial to determine and understand the complex interplay of factors that are associated with usage and/or non-use (Beck et al., 2014; Becker et al., 2012; NIDA, 2014; Schulenberg et al., 2017; White et al., 2005). As such, Bronfenbrenner's broad Ecological Systems Theory (EST) was utilised to explore the possible reasons for substance use among students. It was also applied to reveal and unravel the multiple, possible, inter-related contributing factors for this phenomenon, with the focus on the microlevel system of EST, namely, the individual and his/her immediate social domains (Bronfenbrenner, 2005). In the foregoing analyses the study looked at students' age, gender, environment and mental health – all of which forms part of the individual's micro-level domain. Other systems of the EST were not considered, as it is understood that no individual study could account for all the levels of the EST sufficiently. It was one of the many reasons that the researcher focused on one level of the systems theory as opposed to all.

In considering the non-significant associations presented for both age and gender, this could be indicative of the evolution of societal norms and expectations, for example, more recently it has become much more 'acceptable' for females and younger persons to use substances, especially, alcohol, compared to just a few years ago (Hemsing & Greaves, 2020; Kulis, Marsiglia, & Hurdle, 2003). Similarly, contextual factors such as the students' home environment, group of peers and/or socio-economic status, amongst other factors could supersede factors such as age and/or gender. In this regard, it would be useful for preventative measures to focus on all age groups and genders, and not place undivided attention on either. This should be considered to not only to foster inclusivity but to avoid the potential risk of the exclusion of individuals who might require support equally.

In terms of the significant associations found between substance use and the university environment and students' SRQ scores (mental health) suggests that both factors appear to be related to the use and or abuse of substance use. Therefore, the presence of depression and anxiety as well as the significant changes that accompany embarking on tertiary studies contributes towards substance use. As such, more concerted efforts in terms of

the associated factors need to be developed. This is one of the only ways to help solidify the results of previous studies. It is, of course, advised to interpret this study's results with great caution as it was a cross-sectional study, at one single university which only looked at predetermined factors amongst just over 11% of the total population, as such there is a large breadth of speculation implied in these findings. It is thus suggested and called upon that more research be carried out on the targeted population.

#### **5.4. Conclusion**

This chapter discussed the findings from the research study in relation to previous studies with specific focus on the research objectives of the study. Subsequent to this, the ecological systems theory was used to interpret the results in order to provide a possible framework for prevention. The ensuing chapter sets out to conclude this research report by providing a summary of the main findings, and providing central implications, limitations and recommendations of the study.



## Chapter Six

### Conclusion

This chapter concludes the study on the thesis entitled “Factors associated with substance use among university students in South Africa: Implications for prevention”. The overall aim of the study was to establish the prevalence of and contributory factors associated with substance use among students at a University in the Western Cape, South Africa. The chapter is presented in terms of the main findings, the implications as well as the limitations and recommendations for the study.

#### 6.1. Summary of Main Findings

This section of the report is reserved for presenting a summary of the results in relation to the main research main objectives of the study. A total of 2915 university students participated in the study via an online substance use questionnaire (Appendix C) on SurveyMonkey. A summary of results are as follows:

##### 6.1.1 Prevalence of Substance Use:

- Results show that 62.7% of sampled students ( $N = 2915$ ) indicated that they had started using substances (both alcohol and other substances) after university enrolment.

##### 6.1.2 Types of Substances that are Commonly Used:

- The three most commonly used substances reported were alcohol (80.6%), cannabis (46%) and ecstasy (5.3%) amongst those who used substances after university enrolment.
- Interestingly, ecstasy use was found to be higher than methamphetamine use among students in the Western Cape, an area well-known for its increased methamphetamine use.
- “Other” substances accounted for 8% of the sample, important to note here is that the number of “other” substances evidently surpasses commonly well-known and well-documented substances such as ecstasy ( $n = 96$ ), methamphetamine ( $n = 14$ ), buttons ( $n = 6$ ) and unga ( $n = 1$ ).

##### 6.1.3 Factors Associated with Substance Use:

*Gender*

- A total of 155 females indicated both ‘harmful’ and ‘hazardous’ drinking while the males in the sample accounted for 142 of the sample (which could be indicative of less gendered intersectionality of use).
- Both females and males represented equal proportions of students reporting alcohol ‘dependence’ ( $n = 17$ ).
- Males reported a higher percentage of ‘harmful’ and equal amounts of alcohol ‘dependency’, despite there being twice the number of females in the sample.
- 12% or 172 students reported ‘harmful’ or dependent’ drug use.
- Males reported more ‘dependency’ use, and fairly equal percentage of ‘harmful use, despite of the gender disparity (2:1).
- Overall, contrary to conventional literature, substance use was found to be independent from students’ gender ( $\chi^2(5) = 4.304, p > 0.05$ ).

#### *Age*

- Younger students (18-24) appear to be more prone to use alcohol. Students in this category indicate more ‘hazardous’ (18.1%), ‘harmful’ (1.9%) as well as ‘dependent’ drinking (2.4%) (consistent with literature).
- Little to no harmful/hazardous or dependent drinking was reported by respondents between the ages of 45 and 64.
- Similar to alcohol use, the severity of drug use declines sequentially with age. With the exception of the 45-54 age (24.0%) range which surpasses both 25-34 (15.5%) and 35-44 (5.2%) in terms of reporting no drug-related problems.
- Results did not provide enough evidence to suggest an association between age and substance use ( $\chi^2 = 6.03, p > 0.05$ ) (contradicting mainstream literature).

#### *University Setting*

- Chi-square analysis revealed a negative association between the university environment and student substance use ( $p < 0.05$ )
- Overall, the findings contradicts prevailing literature as it suggests a reduction in substance use after being exposed to the university environment.

#### *Mental Health*

- Students who reported substance use at university reported higher SRQ-25 (depression and anxiety) scores.

- The presence of depression and anxiety among substance users were found to be clinically significant by definition (mean value of 7.42).
- Interestingly, findings reveal no significant association ( $p = .233$ ) between being a substance user and nonsubstance user and students respective PSS-10 (self-perceived stress) scores.
- A mean score of 19.99 was established among the sample, suggesting that students reported having moderate stress levels as per PSS-10.
- These results from the PSS-10 questionnaire are in contrast to volumes of studies which found significant associations between students' substance use and their level of psychological distress.

## 6.2. Implications of the Study

The insights to be gained from this study could serve several purposes and contribute towards the prevention and reduction of substance use and/or abuse among university students in several ways:

- In its entirety, the study contributes to the overall scarcity of existing knowledge on substance use and abuse among university students in South Africa;
- Respectively, it presents significant insights into the demographic makeup and perceived risk factors of both substance and nonsubstances users' – pre and post university enrolment;
- The study sheds light on the current prevalence and the extent to which students' use and/or abuse substances in a previously underexplored population in the Western Cape;
- The inquest of genders in terms of a spectrum rather than the conventional binary (males/female) format, allows for a greater understanding of the many complexities' researchers' need to reconsider when investigation the “well-known/well-documented” factors;
- In addition to reporting on the “conventionally” well-document substances, such as alcohol, weed, methamphetamine and heroin in South Africa, this study also provided a platform where students could disclose their use and/or abuse of other types of substance use. This information could prove useful for any future attempts to tailor, inform and/or contextualise research endeavours of a similar nature.
- The unanticipated findings relating to the assortment of substances could be indicative of a gradual paradigm shift in the types of substances commonly reported/used by

university students at this point in time as well as who (males/females) is using substances and when (age of participants)

- The novel findings of this study could serve as a baseline input to inform policy makers, programme developers, service providers, parents, and other stakeholders who are involved in the design and implementation of more effective awareness, prevention and needs-based intervention services; and
- The findings of this study could also serve as a feature map for future research relating to substance use in and around South Africa.

The overall aim of the study was to explore the prevalence and factors associated with substance among university students in South Africa in order to provide baseline information which could inform the development and/or tailoring of any awareness and or prevention campaigns designed to reduce substance use and abuse among students in South Africa. It furthermore sought to add sustenance to the dearth of local literature on the subject available in South Africa. Perhaps more importantly, it is hoped that the results, implications, limitation and recommendation of the present study invokes increased focus and ignites novel or innovative thinking when undertaking research of similar nature.

### **6.3. Limitations of the Study**

That which follows is not intended to be an exhaustive listing of every conceivable limitation during this research undertaking, instead it should be perceived as a subjective interpretation of how the researcher's perceived the limitations of this research report. The aforesaid discussions and results provide valuable information about the target population, although it does come with its own shortcomings.

The results produced above, although valuable, reflects a single, purposefully selected university in the Western Cape. Given the varying demographic structure and socio-economic landscape within the Western Cape, the prevalence, types of substances used and factors associated with substance use and/or abuse among university students in the Western Cape could vary depending on where the university is situated, the environment it fosters as well as the policies each of them implement. Therefore, generalisation should be taken with excess caution when comparing it to all Universities in the Western Cape, even more so in other parts in South Africa. It is therefore recommended that studies of a similar nature be conducted to explore substance use and abuse among other university students in other parts

of the country in order to ascertain any similarities and difference among university students in different environments, and how any potential differences and/or similarities could better inform preventative measures.

It is also essential to mention here that the questionnaire disseminated to the targeted population was done so in only one of the three official languages within the Western Cape, that i.e. English. This was done in order to align with the University's primary medium of teaching and of examination, which is, English. Except, of course, in language and literature departments where another language is taught and may be used. This being said, the official language policy of the Western Cape Government (Western Cape Government, 2019) encourages the promotion and use of all of the three official languages of the Western Cape, namely Afrikaans, isiXhosa and English where possible. It is thus recommended that future research carried out in different provinces and or countries consider the official languages of the population under study and strive to provide the respondent with an equal opportunity to interpret and answer questions in their mother tongues.

As with most self-report cross-sectional studies, social desirability bias is another important aspect that is considered to be one of the most common and pervasive sources of bias affecting the validity of survey research findings. Social desirability bias refers to the tendency respondents have to present and align themselves and their reality with what they believe to be socially acceptable. Put differently, respondents tend to present themselves in a more favourable way, usually relative to the prevailing social norms found in their environments (Neuman, 2014). Apart from the social desirability bias, it is important to bear in mind that students received the online link by means of an email that was sent to their University student email addresses within a specific timeframe, from 29 July – 27 September 2019. The implications here are that students who were absent, or who did not have access to the necessary resource to complete the questionnaire could have been excluded. It is therefore recommended that future research undertakings of a similar nature factor in said exclusions and take measures to make available the necessary resources required by targeted populations in order to possibly facilitate higher response rates.

Although useful, the cross-sectional design has been criticised for only examining particular aspects of individual's beliefs and behaviours without paying concerted consideration to the context in which these beliefs and behaviours occur, which could account

for misinterpretation of meanings of the beliefs and/or behaviour recorded (de Vaus, 2001). As such, it is necessary to exercise caution when interpreting results in this study.

Furthermore, when interpreting the results of the study it is perhaps useful to also bear in mind that the AUDIT questionnaire was completed by 61.9% of females, 35.5% males, 0.7% non-binary/third gender, 0.9% of respondents who preferred not to answer, 0.5% who decided to self-describe. Similarly, the DUDIT questionnaire was completed by 64.3% of females, 33.7% males, 0.4% non-binary/third gender, 0.8% of respondents who preferred not to answer and 0.3% who decided to self-describe. Therefore, although the results indicate that a larger percentage of alcohol users are female, what can also be inferred from the observation is that this could merely reflect the imbalance of genders among the respondents in the study.

Taking the aforesaid findings into consideration, it is hoped that the current study's results would call upon researchers to further investigate the association of factors in relation to an array of substances other than alcohol. This might be essential in the identification of an increase and/or decrease of many substances, and the identification of newly introduced substances, which is vital for the creating of awareness-, prevention- campaigns as well as intervention strategies aimed at the population under study.

#### **6.4. Recommendations of the Study**

A conclusion of the limitations and recommendations of this study cannot be complete without calling for more comprehensive efforts (multidisciplinary) when investigating the use and abuse amongst individuals in our society. Since this research is observational, experimental research are recommended to identifying effective intervention options for mitigating the burden of substance abuse among university students.

Discovering these influencing factors (both risk- and protective) would decrease the probability of an individual using drugs, would once again pinpoint areas one could focus on with interventions, which would empower those in need of intervention, as opposed to educating only. A determination should also be done on evidence-based "best practices" for the primary prevention, as well as the treatment of substance abuse among adolescents in South Africa.



In attempts to promote and adhere to the ethical principles of avoiding harm, giving respect and protecting participants' integrity, the author advocacy plea is to cultivate more inclusivity in future research endeavours, especially in the social sciences. Such efforts could begin by exploring social constructs such as gender on a non-binary spectrum. In addition to this, more cultural sensitive, multi-wave longitudinal research need to be carried out in order to improve on, and expand the understanding of substance use and abuse among young people in South Africa, particularly those transitioning from childhood to adolescence to young adulthood, during which pervasive individual and contextual change is the bedrock of these developmental transitions.



## References

- Adams, J., Hollenberg, D., Lui, C. W., & Broom, A. (2009). Contextualizing integration: A critical social science approach to integrative health care. *Journal of Manipulative and Physiological Therapeutics*, 32(9), 792-798.
- Adekeye, O. A., Adeusi, S. O., Chenube, O., Ahmadu, F. O., & Sholarin, M. A. (2015). Assessment of alcohol and substance use among undergraduates in selected private universities in Southwest Nigeria. *IOSR Journal of Humanities and Social Science*, 20(3), 1-7.
- Arnett, J. J. (2005). The developmental context of substance use in emerging adulthood. *Journal of Drug Issues*, 35(2), 235-254.
- Arria, A., Caldeira, K., Bugbee, B., Vincent, K., & O'Grady, K. (2013). *The academic opportunity costs of substance use during college*. Spokane, WA: University of Maryland.
- Atwoli, L., Munjla, P. A., Ndung'u, M. N., Kinoti, K. C., & Ogot, E. M. (2011). Prevalence of substance use among college students in Eldoret, Western Kenya. *BMC Psychiatry*, 11(1), 1-9.
- Babbie, E. (2006). *The practice of social research* (11th ed.). Belmont, CA: Wadsworth.
- Babbie, E. & Mouton, J. (2001). *The practice of social research*. Cape Town: Oxford University Press.
- Babor, T. F., Higgins-Biddle, J. C., Saunders, J. B., & Monteiro, M. G. (2001). *The alcohol use disorders identification test*. Geneva: World Health Organization.
- Beck, F., Legleye, S., Chomynova, P., & Miller, P. (2014). A quantitative exploration of attitudes out of line with the prevailing norms toward alcohol, tobacco, and cannabis use among European students. *Substance Use & Misuse*, 49(7), 877-890.

- Becker, J. B., Perry, A. N., & Westenbroek, C. (2012). Sex differences in the neural mechanisms mediating addiction: a new synthesis and hypothesis. *Biology of Sex Differences*, 3(1), 14. <https://doi.org/10.1186/2042-6410-3-14>
- Berk, L.E. 2000. *Child Development* (5th ed.). Boston: Allyn and Bacon.
- Bennett, T. H., & Holloway, K. R. (2014). Drug misuse among university students in the UK: implications for prevention. *Substance Use & Misuse*, 49(4), 448-455.
- Berman, A. H., Bergman, H., Palmstierna, T., & Schlyter, F. (2005). Evaluation of the Drug Use Disorders Identification Test (DUDIT) in criminal justice and detoxifications settings and in Swedish population sample. *European Addiction Research*, 11(1), 22–31.
- Bewick, B. M., Mulhern, B., Barkham, M., Trusler, K., Hill, A. J., & Stiles, W. B. (2008). Changes in undergraduate student alcohol consumption as they progress through university. *BMC Public Health*, 8(1), 163.
- Birhanu, A. M., Bisetegn, T. A., & Woldeyohannes, S. M. (2014). High prevalence of substance use and associated factors among high school adolescents in Woreta Town, Northwest Ethiopia: multi-domain factor analysis. *BMC Public Health*, 14(1), 1186.
- Blanchard, J. J., Brown, S. A., Horan, W. P., & Sherwood, A. R. (2000). Substance use disorders in schizophrenia: review, integration, and a proposed model. *Clinical Psychology Review*, 20(2), 207-234.
- Bogg, T., & Finn, P. (2009). An ecologically based model of alcohol-consumption decision making: Evidence for the discriminative and predictive role of contextual reward and punishment information. *Journal of Studies on Alcohol and Drugs*, 70, 446-457.
- Boulard, A., Quertemont, E., Gauthier, J. M., & Born, M. (2012). Social context in school: Its relation to adolescents' depressive mood. *Journal of Adolescence*, 35(1), 143-152.
- Brady, K. T., & Randall, C. L. (1999). Gender differences in substance use disorders.

*Psychiatric Clinics of North America*, 22(2), 241-252.

Bronfenbrenner, U. (1993). Ecological models of human development. In Gauvain, M. & Cole, M. (Eds.). *Readings on the development of children*, 2nd edition. New York: Freeman, 37-43.

Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development*. USA: Sage Publications.

Brook, J. S., Cohen, P., & Brook, D. S. (1998). Longitudinal study of co-occurring psychiatric disorders and substance use. *Journal of the American Academy of Child and Adolescent Psychiatry*, 37(3), 322–330.

Brook, D., Rubenstone, E., Zhang C., Morojele, N.K., Brook, JS. (2011). Environmental stressors, low well-being, smoking, and alcohol use among South African adolescents. *Social Science & Medicine*, 72, 1447-1453.

Bunevicius, A., Katkute, A., & Bunevicius, R. (2008). Symptoms of anxiety and depression in medical students and in humanities students: relationship with big-five personality dimensions and vulnerability to stress. *International Journal of Social Psychiatry*, 54(6), 494-501.

Burrow-Sanchez, J. J., Martinez Jr, C. R., Hops, H., & Wrona, M. (2011). Cultural accommodation of substance abuse treatment for Latino adolescents. *Journal of Ethnicity in Substance Abuse*, 10(3), 202-225.

Center for Behavioral Health Statistics and Quality. (2016). *Key substance use and mental health indicators in the United States: Results from the 2015 National Survey on Drug Use and Health* (HHS Publication No. SMA 16-4984, NSDUH Series H-51).

Retrieved from <http://www.samhsa.gov/data/>

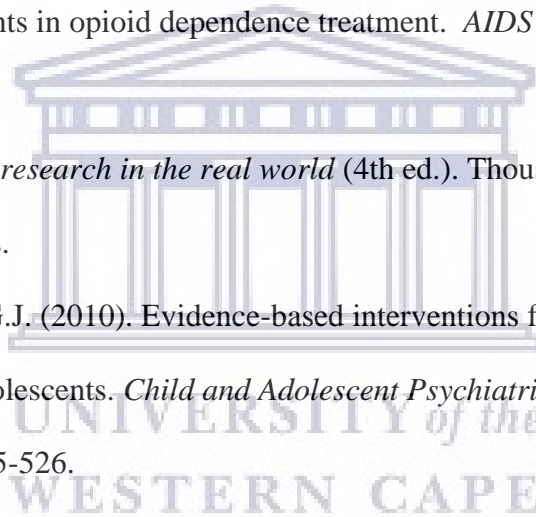
- Chavez-Palacio, E, Graf, N, Blanco, E. (2012). Cannabis, culture and anxiety: Attitudes of Mexican-American college students on the US/Mexico Border. *Journal of Rehabilitation, 78*(4),11-20.
- City of Cape Town. (2013). *Crime in Cape Town: Drug related 2003-2012*. Cape Town: Strategic Development Information and Government Communication and Information System (GCIS).
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*(4), 385-396.
- Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment 6*(2), 117–128.
- Cooper, M. L. (2002). Alcohol use and risky sexual behavior among college students and youth: evaluating the evidence. *Journal of Studies on Alcohol, (14)*, 101–117.
- Corbin, W. R., Vaughan, E. L., & Fromme, K. (2008). Ethnic differences and the closing of the sex gap in alcohol use among college-bound students. *Psychology of Addictive Behaviors, 22*(2), 240–248.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: SAGE Publications.
- Dada, S., Burnhams, N. H., Erasmus, J., Lucas, W., Parry, C., Bhana, A. (2019). *Monitoring alcohol, tobacco, and other drug abuse treatment admissions in South Africa* (Research Report Phase 41). Retrieved from:  
<https://www.samrc.ac.za/sites/default/files/attachments/2019-04-30/SACENDUFullReportPhase44.pdf>
- Dada, S., Erasmus, J., Burnhams, N. H., Erasmus, J., Parry, C., Bhana, A., ... Fourie, D. (2017). *Monitoring alcohol, tobacco, and other drug abuse treatment admissions in South Africa* (Research Report Phase 41). Retrieved from

<http://www.mrc.ac.za/sites/default/files/attachments/2017-12-01/SACENDUPhase41.pdf>

- Damato, K. E. (2017). Prevalence of substance use in high school students from the United States (Master's thesis). Rowan University: Rowan Digital Works.
- Dawson, D. A., Grant, B. F., Stinson, F. S., & Chou, P. S. (2004). Another look at heavy episodic drinking and alcohol use disorders among college and noncollege youth. *Journal of Studies on Alcohol*, 65(4), 477-488.
- Department of Basic Education. (2013). *National strategy for the prevention and management of alcohol and drug use amongst learners in schools*. Pretoria.
- Demery, R., Thirlaway, K., & Mercer, J. (2012). The experiences of university students with a mood disorder. *Disability & Society*, 27(4), 519–533.
- de Vaus, D. (2001). *Research Design in Social Sciences*. London: SAGE Publications.
- de Vaus, D. (2014). *Surveys in social research* (6th ed.). London: Routledge.
- Deykin, E. Y., J. C. Levy, & V. Wells. (1987). Adolescent depression, alcohol and drug abuse. *American Journal of Public Health*, 77(2), 178–182.
- Du Preez, R., Pentz, C. D., & Lategan, B. W. (2016). Why students drink: A study of South African University students' drinking behaviour. *South African Journal of Higher Education*, 30(2), 73-93.
- Edmonds, L., & Wilcocks, L. (2001). *Teen drug scene in South Africa: guide for parents and schools*. Johannesburg: Little Oak Publications.
- Eme, R. (2017). The overlapping neurobiology of addiction and ADHD. *Mental Health and Addiction Research*. <https://doi.org/10.15761/MHAR.1000129>
- Eriksson, A., & Olsson, B. (2004). Alcohol habits amongst students. Consumption, consequences and attitudes amongst college students and other in the ages 19-29

- years. *SoRAD - Centre for Social Research on Alcohol and Drugs, Research Report no. 19*. SoRAD Report Series. SoRAD, Stockholm.
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1-4. <https://doi.org/10.15761/MHAR.1000129>
- Feld, L. D., & Shusterman, A. (2015). Into the pressure cooker: student stress in college preparatory high schools. *Journal of Adolescence*, 41, 31–42.
- Fernander, A.F., Flisher, A.J., King, G., Noubary, F., Lombard, C., Price, M., et al. (2006). Gender differences in depression and smoking among youth in Cape Town, South Africa. *Ethnicity & Disease*, 16, 41-50.
- Flisher, A. J., Parry, C. D., Evans, J., Muller, M., & Lombard, C. (2003). Substance use by adolescents in Cape Town: Prevalence and correlates. *Journal of Adolescent Health*, 32(1), 58-65.
- Frezza, M., di Padova, C., Pozzato, G., Terpin, M., Baraona, E., & Lieber, C. S. (1990). High blood alcohol levels in women: the role of decreased gastric alcohol dehydrogenase activity and first-pass metabolism. *New England Journal of Medicine*, 322(2), 95-99.
- Fromme, K., Corbin, W. R., & Kruse, M. I. (2008). Behavioral risks during the transition from high school to college. *Developmental Psychology*, 44(5), 1497.
- Galanter, M. (2006). Spirituality and addiction: A research and clinical perspective. *American Journal on Addictions*, 15(4), 286-292.
- Germain, C. B. (1991). *Human behavior in the social environment: An ecological approach*. New York: Columbia University Press.
- Goreishi, A., & Shajari, Z. (2013). Substance abuse among students of Zanjan's Universities (Iran): A knot of today's society. *Addict Health*, 5(1-2), 66-72.

- Ghuman, S., Meyer-Weitz, A., & Knight, S. (2012). Prevalence patterns and predictors of alcohol use and abuse among secondary school students in southern KwaZulu-Natal, South Africa: demographic factors and the influence of parents and peers. *South Africa Family Practice*, 54, (2), 132-138.
- Gopiram, P., & Kishore, M. T. (2014). Psychosocial attributes of substance abuse among adolescents and young adults: A comparative study of users and non-users. *Indian Journal of Psychological Medicine*, 36(1), 58.
- Gonzalez, A., Mimiaga, M. J., Israel, J., Bedoya, C. A., & Safren, S. A. (2013). Substance use predictors of poor medication adherence: the role of substance use coping among HIV-infected patients in opioid dependence treatment. *AIDS and Behavior*, 17(1), 168-173.
- Gray, D. E. (2013). *Doing research in the real world* (4th ed.). Thousand Oaks, California: SAGE Publications.
- Griffin, K.W., & Botvin, G.J. (2010). Evidence-based interventions for preventing substance use disorders in adolescents. *Child and Adolescent Psychiatric Clinics of North America*, 19(3), 505-526.
- Griffin, K. W., Lowe, S. R., Acevedo, B. P., & Botvin, G. J. (2015). Affective self-regulation trajectories during secondary school predict substance use among urban minority young adults. *Journal of Child & Adolescent Substance Abuse*, 24(4), 228-234.
- Grove, S. K., Burns, N., & Gray, J. R. (2013). The practice of nursing research. *Appraisal, synthesis and generation of evidence* (7th ed.). St Louis: Elsevier Saunders.
- Harding, T. W., De Arango, V., Baltazar, J., Climent, C. E., Ibrahim, H. H. A., Ladrigo-Ignacio, L., & Wig, N. N. (1980). Mental disorders in primary health care: a study of their frequency and diagnosis in four developing countries. *Psychological medicine*, 10(2), 231-241.





- Harford, T. C., Wechsler, H., & Seibring, M. (2002). Attendance and alcohol use at parties and bars in college: A national survey of current drinkers. *Journal of Studies on Alcohol*, 63(6), 726-733.
- Hasking, P., Lyvers, M., & Carlopio, C. (2011). The relationship between coping strategies, alcohol expectancies, drinking motives and drinking behaviour. *Addictive Behaviors* 36(5), 479–487.
- Hemsing, N., & Greaves, L. (2020). Gender norms, roles and relations and cannabis-use patterns: a scoping review. *International Journal of Environmental Research and Public Health*, 17(3), 947.
- Hingson, R. W., Heeren, T., Zakocs, R. C., Kopstein, A., & Wechsler, H. (2002). Magnitude of alcohol-related mortality and morbidity among US college students ages 18-24. *Journal of Studies on Alcohol*, 63(2), 136-144.
- Hoffman, R., & al'Absi, M. (2013). Concurrent use of khat and tobacco is associated with verbal learning and delayed recall deficits. *Addiction*, 108(10), 1855-1862.
- Hudson, A., Thompson, K., MacNevin, P. D., Ivany, M., Teehan, M., Stuart, H., & Stewart, S. H. (2018). University students' perceptions of links between substance use and mental health: A qualitative focus group study. *Emerging Adulthood*, 6(6), 399-410.
- Hyde, J. S., Bigler, R. S., Joel, D., Tate, C. C., & van Anders, S. M. (2019). The future of sex and gender in psychology: Five challenges to the gender binary. *American Psychologist*, 74(2), 171.
- Jafari, F., Zamani, A. H., & Alizadeh, K. (2011). Reviewing the prevalence of (cigarette) smoking and its related factors in students of Tehran university, Iran. *Addiction & Health*, 3(3-4), 105.
- Jain, A. (2013). Clinical implications of the sex and gender differences associated with substance use disorders. *Australian Medical Student Journal*, 6(2), 81-84.

- Jaouahir, I., Azzaoui, F. Z., Lotfi, S., Ahami, A., Faid, M., & Rusinek, S. (2015). Listening withdrawal psychotherapy from psychoactive substances addiction among young Moroccan trainees. *International Journal of Multidisciplinary Approach & Studies*, 2(6), 158-165.
- Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2009). *Monitoring the future: National survey results on drug use, 1975–2008*. Bethesda, MD: National Institute on Drug Abuse.
- Johnston, L. D., Schulenberg, J. E., O'Malley, P. M., Bachman, J. G., Miech, R. A., & Patrick, M. E. (2017). *Demographic subgroup trends among young adults in the use of various licit and illicit drugs, 1988-2016* (Monitoring the Future Occasional Paper No. 89). Ann Arbor, MI: Institute for Social Research, University of Michigan.
- Jordan, P (2015). *Drug abuse is damaging South Africa's youth trends*. Retrieved from <http://www.fanews.co.za/article/healthcare/6/general/1124/drug-abuse-is-damaging-south-africa-s-youth/13795>
- Kalsi, H. 2015. *Substance abuse amongst high school and college students*. USA: University of Vermont.
- Kandall, S. R. (1999). *Substance and shadow: Women and addiction in the United States*. Harvard University Press.
- Kanyoni, M., Gishoma, D., & Ndahindwa, V. (2015). Prevalence of psychoactive substance use among youth in Rwanda. *BMC Research Notes*, 8(1), 190.
- Karama, E., Kypri, K., & Salamoun, M. (2007). Alcohol use among college students: an international perspective. *Current Opinion in Psychiatry*, 20(3), 213-221.
- Kassa, A., Tadesse, F., & Yilma, A. (2014). Prevalence and factors determining psychoactive substance (PAS) use among Hawassa University (HU) undergraduate students, Hawassa Ethiopia. *BMC Public Health*, 14(1), 1044.

- Kothari, C. R. (2004). *Research Methodology: Methods & Techniques* (2nd ed.). Delhi: New Age International Ltd.
- Kelly, A. B., & Chan, C. K. (2015). The relationship between psychological distress and adolescent poly drug Use. *Psychology of Addictive Behaviors*, 29(3),787–793.
- Kirst, M., Frederick, T., & Erickson, P. G. (2011). Concurrent mental health and substance use problems among street-involved youth. *International Journal of Mental Health and Addiction*, 9(5), 543-553.
- Krauss, S. E. (2005). Research paradigms and meaning making: A primer. *The Qualitative Report*, 10(4), 758-770.
- Kulis, S., Marsiglia, F. F., & Hurdle, D. (2003). Gender identity, ethnicity, acculturation, and drug use: Exploring differences among adolescents in the Southwest. *Journal of Community Psychology*, 31(2), 167-188.
- Kushner, M. G., & Sher, K. J. (1993). Comorbidity of alcohol and anxiety disorders among college students: Effects of gender and family history of alcoholism. *Addictive Behaviors*, 18(5), 543-552.
- Kyei, K.A., & Ramagoma, M. (2013). Alcohol consumption in South African universities: prevalence and factors at the university of Venda, Limpopo Province. *Journal of Social Science*, 36(1), 77-86.
- Kypri, K., Cronin M., & Wright C. S. (2005). Do university students drink more hazardously than their non-student peers? *Addiction*, 100(5) 71, 3–714.
- Lakkonen, M. (2014). In terms of black and white: Politically correct racial terminology in South Africa and the United States in the 1950's and 2000's (Master's thesis, University of Eastern Finland). Retrieved from [epublications.uef.fi/pub/urn\\_nbn-fi\\_uef.../urn\\_nbn-fi\\_uef-20141453.pdf](http://epublications.uef.fi/pub/urn_nbn-fi_uef.../urn_nbn-fi_uef-20141453.pdf)

- Laska, M. N., Pasch, K. E., Lust, K., Story, M., & Ehlinger, E. (2009). Latent class analysis of lifestyle characteristics and health risk behaviors among college youth. *Prevention Science, 10*(4), 376-386.
- Lategan, B. W., du Preez, R., & Pentz, C. D. (2017). Socio-demographic insights into South African student drinking behaviour. *South African Journal of Higher Education, 31*(5), 90-115.
- Lemelin, C., Lussier, Y., Sabourin, S., Brassard, A., & Naud, C. (2014). Risky sexual behaviours: The role of substance use, psychopathic traits, and attachment insecurity among adolescents and young adults in Quebec. *The Canadian Journal of Human Sexuality, 23*(3), 189-199.
- Lieber, C. S. (1997). Ethanol metabolism, cirrhosis and alcoholism. *Clinica chimica acta, 257*(1), 59-84.
- Lin, H. J., & Yusoff, M. S. B. (2013). Psychological distress, sources of stress and coping strategy in high school students. *International Medical Journal, 20* (6), 672–676.
- Lorant, V., Nicaise, P., Soto, V. E., & d'Hoore, W. (2013). Alcohol drinking among college students: college responsibility for personal troubles. *BMC Public Health, 13*(1), 615.
- Lubaale, E. C., & Mavundla, S. D. (2019). Decriminalisation of cannabis for personal use in South Africa. *African Human Rights Law Journal, 19*(2), 819-842.
- Mackert, M., Mabry, A., Hubbard, K., Grahovac, I., & Holleran Steiker, L. (2014). Perceptions of Substance Abuse on College Campuses: Proximity to the Problem, Stigma, and Health Promotion. *Journal of Social Work Practice in the Addictions, 14*(3), 273-285.
- Madu, S. N., & Matla, M. Q. P. (2003). Illicit drug use, cigarette smoking and alcohol drinking behaviour among a sample of high school adolescents in the Pietersburg area of the Northern Province, South Africa. *Journal of Adolescence, 26*(1), 121-136.

- Mahajan, A. S. (2010). Stress in medical education: A global issue or much ado about nothing specific. *South-East Asian Journal of Medical Education*, 4(2), 9-13.
- Maier, L. J., Liechti, M. E., Herzig, F., & Schaub, M. P. (2013). To dope or not to dope: neuroenhancement with prescription drugs and drugs of abuse among Swiss university students. *PloS One*, 8(11), e77967. [https:// doi: 10.1371/journal.pone.0077967](https://doi.org/10.1371/journal.pone.0077967)
- Malaju, M. T., & Asale, G. A. (2013). Association of khat and alcohol use with HIV infection and age at first sexual initiation among youths visiting HIV testing and counseling centers in Gamo-Gofa Zone, South West Ethiopia. *Bio-Medical Centre-International Health and Human Rights*, 13(10), 1-8.
- McClellan, M. L. (2011). Historical perspectives on alcoholism treatment for women in the United States, 1870–1990. *Alcoholism Treatment Quarterly*, 29(4), 332-356.
- McClellan, M. L. (2017). *Lady luses: Gender, alcoholism, and medicine in modern America*. Rutgers University Press.
- Meade, C. S., Watt, M. H., Sikkema, K. J., Deng, L. X., Ranby, K. W., Skinner, D., ... & Kalichmann, S. C. (2012). Methamphetamine use is associated with childhood sexual abuse and HIV sexual risk behaviors among patrons of alcohol-serving venues in Cape Town, South Africa. *Drug and Alcohol Dependence*, 126(1-2), 232-239.
- Mehrabian, A. (2001). General relations among drug use, alcohol use, and major indexes of psychopathology. *Journal of Psychology*, 23(6), 893-907.
- Milojevich, H. M., & Lukowski, A. F. (2016). Sleep and mental health in undergraduate students with generally healthy sleep habits. *PLOS One*, 11 (6), 1-12.
- Morojele, N. K., Parry, C. D. H., Ziervogel, C. F., & Robertson, B. A. (2001). Adolescent alcohol misuse: Correlates and implications. *African Journal of Drug and Alcohol Studies*, 1(2), 111-120.

- Myer, L., Smit, J., Le Roux, L., Parker, S., Stein, D., & Seedat, S. (2008). Common mental disorders among HIV-infected individuals in South Africa: Prevalence, predictors, and validation of brief psychiatric rating scales. *AIDS Patient Care & STDs*, 22(2), 147- 158.
- Myers, A., & Hansen, C. (2012). *Experimental psychology* (7th ed.). Belmont, CA: Cengage Learning.
- National Institute on Drug Abuse (NIDA). (2014). *Principles of adolescent substance use disorder treatment: A Research-based guide*. Washington DC: NIDA Publication.
- National Institute on Drug Abuse, (2017). *College-Age & Young Adults*. Retrieved from <https://www.drugabuse.gov/related-topics/college-age-young-adults>
- National Survey on Drug Use and Health: Summary of National Findings. Retrieved from <http://www.samhsa.gov/data/sites/default/files/NSDUHresultsPDFWHTML2013/We b/NSDUHresults2013.htm#2.5>
- Neuman, W.L. (2006). *Social research methods: Qualitative and quantitative approaches* (6th ed.). Boston: Pearson Prentice-Hall.
- Nyer, M., Farabaugh, A., Fehling, K., Soskin, D., Holt, D., Papakostas, G. I., ...& Mischoulon, D. (2013). Relationship between sleep disturbance and depression, anxiety, and functioning in college students. *Depression and Anxiety*, 30(9), 873-880.
- O'Connell, B. (2011). *Celebrating 50 years of excellence*. Retrieved from <http://mg.co.za/article/2011-02-18-celebrating-50-years-of-excellence>
- O'Malley, P. M., & Johnston, L. D. (2002). Epidemiology of alcohol and other drug use among American college students. *Journal of Studies on Alcohol, Supplement*, (14), 23-39.

- Panday, S., Reddy, S.P., Ruiter, R.C., Bergström, E., De Vries, H. (2007). Determinants of smoking among adolescents in the Southern Cape-Karoo region, South Africa. *Health Promotion International*, 22, 207-217.
- Paquette, D. & Ryan, J. (2001). *Bronfenbrenner's ecological systems theoretical framework*. Retrieved from [http://www.floridahealth.gov/alternatesites/cmskids/providers/early\\_steps/training/documents/bronfenbrenners\\_ecological.pdf](http://www.floridahealth.gov/alternatesites/cmskids/providers/early_steps/training/documents/bronfenbrenners_ecological.pdf)
- Parks, K., Collins, R.L., & Derrick, J. L. (2012). The influence of marijuana and alcohol use on condoms behaviour: Findings from a sample of young adult female bar drinkers. *Psychological Addict Behaviour*, 26(4), 888.
- Peck, R., & Short, T. (2018). *Statistics: Learning from data*. Cengage Learning.
- Peltzer, K., Davids, A., & Njuho, P. (2011). Alcohol use and problem drinking in South Africa: findings from a national population-based survey. *African Journal of Psychiatry*, 14(1), 30-37.
- Peltzer, K., Malaka, D., & Phasawa, N. (2001). Psychological correlates of substance use among South African university Students. *Social Behaviour and Personality*, 29(8), 799-806.
- Peltzer, K., Malaka, D. W., & Phaswana, N. (2002). Sociodemographic factors, religiosity, academic performance, and substance use among first-year university students in South Africa. *Psychological Reports*, 91(1), 105-113.
- Pengpid, S., Peltzer, K., & Van Der Heever, H. (2013). Problem alcohol use and associated factors in a sample of university students in South Africa. *Journal of Psychology in Africa*, 23(2), 243-249.
- Penny, G., & Armstrong-Hallam, S. (2010). *Student choices and alcohol matters (SCAM): A multi-level analysis of student alcohol (mis) use and its implications for policy and*

*prevention strategies within universities, cognate educational establishments and the wider community.* Northampton: Alcohol and Education Research Council.

Polit, D. F., & Beck, C. T. (2008). *Nursing research: Generating and assessing evidence for nursing practice.* Lippincott Williams & Wilkins.

Reddy, S. P., James, S., Sewpaul, R., Koopman, F., Funani, N. I., Sifunda, S., ... & Omardien, R. G. (2010). Umthente uhlaba usamila-the 2nd south African national youth risk behaviour survey 2008. *Cape Town: South African Medical Research Council.*

Reddy, P., Resnicow, K., Omardien, R., & Kambaran, N. (2007). Prevalence and correlates of substance use among high school students in South Africa and the United States. *American Journal of Public Health, 97*(10), 1859-1864.

Reddy, S. P., James, S., Sewpaul, R., Koopman, F., Funani, N., Sifunda, S., ... & Omardien, R. (2008). Umthente Uhlaba Usamila - The second South African youth risk behaviour survey. Cape Town: South African Medical Research Council.

Reinert, D. F., & Allen, J. P. (2007). The alcohol use disorders identification test: An update of research findings. *Alcoholism: Clinical and Experimental Research, 31*(2), 185–199.

Research Policy of the University of the Western Cape. (2009). Retrieved from <https://www.uwc.ac.za/SO/BIC/TTO/Documents/UWC%20Research%20Policy.pdf>

Rodrigues, T. C. (2002). An exploration of students' experiences during the selection process for the M.Psych degree (Clinical, counselling and educational) at the University of the Western Cape (Unpublished Masters Thesis). University of the Western Cape.

Roditis, M. L., Wang, D., Glantz, S. A., & Fallin, A. (2015). Evaluating California campus tobacco policies using the American college health association guidelines and the institutional grammar tool. *Journal of American College Health, 63*(1), 57-67.



- Ross, V., & DeJong, W. (2008). *Alcohol and other drug abuse among first-year college students*. Infofacts/Resources: Higher Education Center for Alcohol and Other Drug Abuse and Violence Prevention.
- Rozenbroek, K., & Rothstein, W. G. (2011). Medical and nonmedical users of prescription drugs among college students. *Journal of American College Health, 59*(5), 358-363.
- Rozmus, C. L., Evans, R., Wysochansky, M., & Mixon, D. (2005). An analysis of health promotion and risk behaviors of freshman college students in a rural southern setting. *Journal of Pediatric Nursing, 20*(1), 25-33.
- Sadava, S. W., & Pak, A. W. (1993). Stress-related problem drinking and alcohol problems: A longitudinal study and extension of Marlatt's model. *Canadian Journal of Behavioural Science, 25*(3), 446.
- Saunders, J. B., Aasland, O. G., Babor, T. F., de la Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption—II. *Addiction, 88*(6), 791-804.
- Schneider, M., Norman, R., Parry, C., Bradshaw, D., Plüddemann, A., and the South African Comparative Risk Assessment Collaborating Group. (2007). Estimating the burden of disease attributable to alcohol use in South Africa in 2000. *South African Medical Journal, 97*, 664-672.
- Schulenberg, J. E., Johnston, L. D., O'Malley, P. M., Bachman, J. G., Miech, R. A., & Patrick, M. E. (2017). *Monitoring the future national survey results on drug use, 1975–2016: Volume II, college students and adults ages 19–55*. Ann Arbor, MI: Institute for Social Research, The University of Michigan.

- Schulenberg, J. E., & Maggs, J. L. (2002). A developmental perspective on alcohol use and heavy drinking during adolescence and the transition to young adulthood. *Journal of Studies on Alcohol, Supplement*, (14), 54-70.
- Schulenberg, J. E., & Patrick, M. E. (2012). Historical and developmental patterns of alcohol and drug use among college students: Framing the problem. In H. R. White & D. Rabiner (Eds.), *College drinking and drug use* (pp. 13–35). New York, NY: Guilford Press.
- Seedat, M., Van Niekerk, A., Jewkes, R., Suffla, S., & Ratele, K. (2009). Violence and injuries in South Africa: prioritising an agenda for prevention. *The Lancet*, 374(9694), 1011-1022.
- Segalo, P. (2015). Gender, social cohesion and everyday struggles in South Africa. *Psychology in Society*, (49), 70-82.
- Shafer, A. B., Koenig, J. A., & Becker, E. A. (2017). Relation of Mental Health to Alcohol and Substance Use Among Texas College Students. *Texas medicine*, 113(4), e1-e1.
- Shimmin, C. (2009). Understanding stigma through a gender lens. *Canadian Women's Health Network*, 11(2), 14-7.
- Sonn, C. C., & Fisher, A. T. (2003). Identity and oppression: Differential responses to an in-between status. *American Journal of Community Psychology*, 31(1/2), 117-128.
- Sommet, A., Ferrières, N., Jaoul, V., Cadieux, L., Soulat, J. M., Lapeyre-Mestre, M., & Montastruc, J. L. (2012). Use of drugs, tobacco, alcohol and illicit substances in a French student population. *Thérapie*, 67(5), 429-435.
- Sorsdahl, K., Stein, D. J., & Myers, B. (2012). Negative attributions towards people with substance use disorders in South Africa: variation across substances and by gender. *BMC Psychiatry*, 12(1), 101.

- Slutske, W. S., Hunt-Carter, E. E., Nabors-Oberg, R. E., Sher, K. J., Bucholz, K. K., Madden, P. A., ... & Heath, A. C. (2004). Do college students drink more than their non-college-attending peers? Evidence from a population-based longitudinal female twin study. *Journal of Abnormal Psychology, 113*(4), 530.
- Stevanovic, D., Atilola, O., Balhara, Y. P. S., Avicenna, M., Kandemir, H., Vostanis, P., Petrov, P. (2015). The relationships between alcohol/drug use and quality of life among adolescents: An international, cross-sectional study. *Journal of Child & Adolescent Substance Abuse, 24*, 177-185.
- Stewart, R. C., Kauye, F., Umar, E., Vokhiwa, M., Bunn, J., Fitzgerald, M., . . . Creed, F. (2009). Validation of a Chichewa version of the self-reporting questionnaire (SRQ) as a brief screening measure for maternal depressive disorder in Malawi, Africa. *Journal of Affective Disorders, 112*(1-3), 126-134.
- Stewart, M. W., & Moreno, M. A. (2013). Changes in attitudes, intentions, and behaviors toward tobacco and marijuana during US students' first year of college. *Tobacco Use Insights, 6*, TUI-S11325.
- Substance Abuse and Mental Health Services Administration. (2014). Results from the 2013 national survey on drug use and health: Summary of national findings. Rockville, MD: Substance Abuse and Mental Health Services Administration.
- Swart, E. & Pettipher, R. (2005). A framework for understanding inclusion. In: Landsberg, E., Kruger, D. & Nel, N. (Eds.). 2005. *Adressing barriers to learning*. Pretoria: Van Schaik, pp. 3-22.
- Swick, K. J., & Williams, R. D. (2006). An analysis of Bronfenbrenner's bio-ecological perspective for early childhood educators: Implications for working with families experiencing stress. *Early Childhood Educational Journal, 33*, 371-378.

- Thomson, K (2013). Overview of the drug abuse problem in South Africa Retrieved from <http://www.harmonygroup.co.za/drugs/overview-of-the-drug-abuse-problem-in-southafrica/>
- United Nations Office on Drugs and Crime (2014). *World drug report 2014*. New York: United Nations.
- Universities South Africa. (2019). *Public universities in South Africa*. Retrieved from <https://www.usaf.ac.za/public-universities-in-south-africa/>
- UWC. (2013a). Welcome to UWC History. Retrieved from University of the Western Cape: <https://www.uwc.ac.za/Pages/History.aspx>
- UWC. (2013b). UWC Faculties. Retrieved from <https://www.uwc.ac.za/Faculties/Pages/default.aspx>
- Vandentorren, S., Verret, C., Vignonde, M., and Maurice-Tison, S. (2005). Determining Students Health Information Needs at the Service of Inter-university preventative medicine in Bordeaux. *Santé Publique, 17*, 47–56.
- Van Der Vorst, H., Vermulst, A. A., Meeus, W. H., Deković, M., & Engels, R. C. (2009). Identification and prediction of drinking trajectories in early and mid-adolescence. *Journal of Clinical Child & Adolescent Psychology, 38*(3), 329-341.
- Verhoog, S., Dopmeijer, J. M., de Jonge, J. M., van der Heijde, C. M., Vonk, P., Bovens, R. H., ... & Kuipers, M. A. (2019). The Use of the Alcohol Use Disorders Identification Test–Consumption as an Indicator of Hazardous Alcohol Use among University Students. *European Addiction Research, 25*(6), 339-347.
- Verhagen, C. E., Uitenbroek, D. G., Schreuders, E. J., El Messaoudi, S., & de Kroon, M. L. A. (2015). Does a reduction in alcohol use by Dutch high school students relate to higher use of tobacco and cannabis? *BMC Public Health, 15*(821), 1-8.

- Webster, L., Chaiton, M., & Kirst, M. (2014). The co-use of tobacco and cannabis among adolescents over a 30-year period. *Journal of School Health, 84*(3), 151-159.
- Wechsler, H., Lee, J. E., Kuo, M., & Lee, H. (2000). College binge drinking in the 1990s: A continuing problem results of the Harvard School of Public Health 1999 College Alcohol Study. *Journal of American College Health, 48*(5), 199-210.
- Wechsler, H., Lee, J. E., Kuo, M., Seibring, M., Nelson, T. F., & Lee, H. (2002). Trends in college binge drinking during a period of increased prevention efforts: Findings from 4 Harvard School of Public Health College alcohol study surveys: 1993–2001. *Journal of American College Health, 50*(5), 203-217.
- Weitzman, E. R., Nelson, T. F., & Wechsler, H. (2003). Taking up binge drinking in college: The influences of person, social group, and environment. *Journal of Adolescent Health, 32*(1), 26-35.
- Western Cape Government. (2019). *Foetal alcohol syndrome awareness programme*. Retrieved from <https://www.westerncape.gov.za/general-publication/foetal-alcohol-syndrome-awareness-programme>
- Western Cape Government. (2019). *Western Cape language policy*. Retrieved from <https://www.westerncape.gov.za/general-publication/western-cape-language-policy>
- Wicki, M., Kuntsche, E., & Gmel, G. (2010). Drinking at European universities? A review of students' alcohol use. *Addictive Behaviors, 35*(11), 913-924.
- Windle, M. (2003). Alcohol use among adolescents and young adults. *Alcohol Research and Health, 27*(1), 79–85.
- White, H. R., McMorris, B. J., Catalano, R. F., Fleming, C. B., Haggerty, K. P., and Abbott, R. D. (2006). Increases in alcohol and marijuana use during the transition out of high school into emerging adulthood: The effects of leaving home, going to college, and high school protective factors. *Journal of Studies on Alcohol, 67*(6), 810–822.

- White, H. R., Labouvie, E. W., & Papadaratsakis, V. (2005). Changes in substance use during the transition to adulthood: A comparison of college students and their noncollege age peers. *Journal of Drug Issues*, 35(2), 281-306.
- World Health Organization (WHO). (2013). Comprehensive mental health action plan 2013–2020. Geneva: World Health Organization.
- WHO. (2014). *Global status report on alcohol and health 2014*. Retrieved from [http://www.who.int/substance\\_abuse/publications/global\\_alcohol\\_report/msb\\_gsr\\_2014\\_1.pdf?ua=1](http://www.who.int/substance_abuse/publications/global_alcohol_report/msb_gsr_2014_1.pdf?ua=1).
- WHO. (2015). MhGAP humanitarian intervention guide (mhGAP-HIG): Clinical management of mental, neurological and substance use conditions in humanitarian emergencies. Geneva: WHO Library Cataloguing.
- Wild, L.G., Flisher, A.J., Bhana, A., & Lombard, C. (2004). Associations among adolescent risk behaviours and self-esteem in six domains. *Journal of Child Psychology and Psychiatry*, 45, 1454-1467.
- World Health Organization. (2018). *Substance abuse*. Retrieved from [https://www.who.int/topics/substance\\_abuse/en/](https://www.who.int/topics/substance_abuse/en/)
- Young, C., & de Klerk, V. (2008). Patterns of alcohol usage on South African university campus: The findings of two annual drinking surveys. *African Journal of Drug and Alcohol Studies*, 7(2), 101–112.
- Young, C., & Mayson, T. (2010). The Alcohol Use Disorders Identification Scale (AUDIT) normative scores for a multiracial sample of Rhodes University residence students. *Journal of Child and Adolescent Mental Health*, 22(1), 15–23.
- Young, M. M., Saewyc, E., Boak, A., Jahrig, J., Anderson, B., Doiron-Brun, Y., & Taylor, S. (2011). *The Cross Canada Report on Student Drug Use*. Ottawa, ON: Canadian Centre on Substance Abuse.
- Young, C., & de Klerk, V. (2012). Correlates of heavy alcohol consumption at Rhodes University. *Journal of Child & Adolescent Mental Health*, 24(1), 37-44.

Yu, J., & Shacket, R.W. (2001) Alcohol use in high school: predicting students' alcohol use and alcohol problems in four-year colleges. *The American Journal of Drug and Alcohol Abuse*, 27(4), 775-793.



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## Appendices

### Appendix A – Participant Information Sheet



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**UNIVERSITY OF THE WESTERN CAPE**  
Private Bag X 17, Bellville 7535, South Africa  
*Tel: +27 21-9392283 Fax: +27 21-959 3515*

#### INFORMATION SHEET

**Project title:** Factors Associated with Substance Use among University Students in South Africa: Implications for Prevention

#### **What is this study about?**

The aim of the proposed study is to establish the prevalence and factors associated with substance use among university students in the Western Cape, South Africa. As such, you are being asked to participate in the study because you are a student at UWC.

#### **What will I be asked to do if I agree to participate?**

You will be requested to complete a demographic information sheet, consent form and a battery of scales to assess the prevalence and factors associated with substance abuse on UWC.

#### **Would my participation in this study be kept confidential?**

The researcher undertakes to protect your identity and the nature of your contribution in the aforementioned study. The confidentiality within the study will be maintained through not requiring any identifiable information from participants, thus maintaining anonymity throughout the research process.

#### **What are the risks of this research?**

All human interactions, including sharing information about one's self or others may carry some risk. This being said, the researcher will at all times try to minimise such risks and act promptly to assist you if you experience any discomfort, psychological or otherwise during the process of your participation in this study. Where necessary, an appropriate referral will be made to a suitable professional for further assistance or intervention.

#### **What are the benefits of this research?**

The information produced from this study could have an impact at individual, family and stakeholders' levels as it will attempt to provide recommendations for suitable awareness and



education programmes regarding alcohol and drug use. The study is expected to provide systemic body of knowledge that could serve as a baseline input for policy function in the struggle to address substance use and abuse in the university setting. Furthermore, it can also serve as a basis for future research and can be applied to other settings with similar context to South Africa's

**Do I have to be in this research and may I stop participating at any time?**

Your participation in this research is completely voluntary. You are free to choose whether you want to participate or not. If you decide to participate in this research, you may stop at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

**What if I have questions?**

If you have any questions about the research study itself, please contact Stacey Blows at 3028910@myuwc.ac.za or Dr Serena Isaacs at sisaacs@uwc.ac.za.

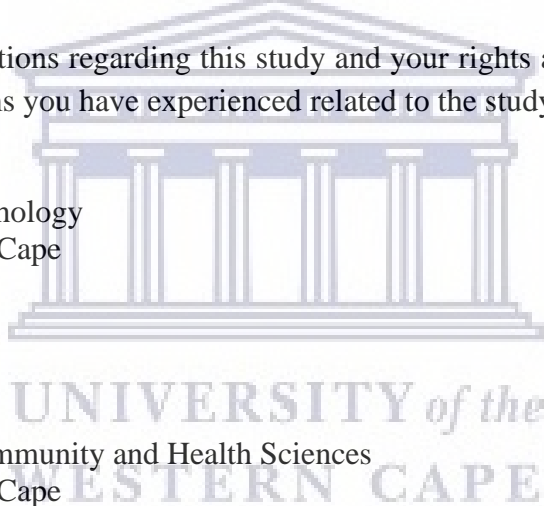
Should you have any questions regarding this study and your rights as a participant or if you wish to report any problems you have experienced related to the study, please contact:

Dr Maria Florence  
Head of Department: Psychology  
University of the Western Cape  
Private Bag X17  
Bellville 7535  
[mflorence@uwc.ac.za](mailto:mflorence@uwc.ac.za)

Prof Anthea Rhoda  
Dean of the Faculty of Community and Health Sciences  
University of the Western Cape  
Private Bag X17  
Bellville 7535  
[chs-deansoffice@uwc.ac.za](mailto:chs-deansoffice@uwc.ac.za)

**This research has been approved by the Biomedical Research Ethics Committee (BMREC) (REFERENCE NUMBER: BM18/9/1).**

Research Development Department  
Email: [research-ethics@uwc.ac.za](mailto:research-ethics@uwc.ac.za)  
Tel: (021) 959 2988



*Appendix B – Consent Form*



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**UNIVERSITY OF THE WESTERN CAPE**  
Private Bag X 17, Bellville 7535, South Africa  
*Tel: +27 21-9392283 Fax: +27 21-959 3515*

**CONSENT FORM**

**Title of Research Project:** Factors Associated with Substance Use among University Students in South Africa: Implications for Prevention

The study has been described to me in language that I understand. My questions about the study have been answered. I understand what my participation will involve and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits. I hereby freely give consent to participate.

1. I hereby freely give my consent to participate

Yes

No

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*Appendix C – Substance Use Questionnaire*

*Demographic Information*



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**Tel: +27 21-9392283 Fax: +27 21-959 3515**

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**DEMOGRAPHIC INFORMATION**

Please complete the following and where appropriate tick the applicable answer.

1. What is your age?

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65 to 74
- 75 or older



2. Please tick the gender that best represents you

- Female
- Male
- Non-binary/third gender
- I prefer not to answer
- I prefer to self-describe

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3. What is your current relationship status?

- Single
- In a relationship
- Married
- Widowed
- Divorced
- Separated

4. Year of study

- 1st year     Honours  
 2nd year     Masters  
 3rd year     PhD

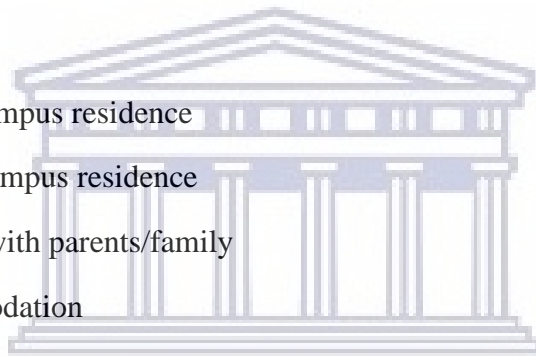
5. Faculty of registration

- |   |   |
|---|---|
| <input type="radio"/> Arts                          | <input type="radio"/> Economic and Management Sciences  |
| <input type="radio"/> Community and Health Sciences | <input type="radio"/> Natural Science                   |
| <input type="radio"/> Law                           | <input type="radio"/> School of Nursing                 |
| <input type="radio"/> Education                     | <input type="radio"/> School of Pharmacy                |
| <input type="radio"/> Natural Science               | <input type="radio"/> School of Government              |
| <input type="radio"/> Dentistry                     | <input type="radio"/> School of Science and Mathematics |

Education

6. Residence

- University on-campus residence  
 University off-campus residence  
 Living at home with parents/family  
 Private accommodation



7. Are you originally from the Western Cape?

- Yes  
 No, I moved here to attend university  
 No, my family relocated  
 If "no", where are you originally

8. Have you ever used any of the following substances before attending university?

- |  |  |
|--|--|
| <input type="radio"/> Alcohol                | <input type="radio"/> E (Ecstasy)  |
| <input type="radio"/> Cannabis (Dagga)       | <input type="radio"/> Tobacco substances (cigarettes, chewing tobacco, cigars, e-cigarettes, etc.) |
| <input type="radio"/> Methamphetamine (Tik)  | <input type="radio"/> None   |
| <input type="radio"/> Buttons (Mandrax)      |  |
| <input type="radio"/> Unga (Heroin)          |  |
| <input type="radio"/> Other (please specify) |  |

9. Have you ever abused any prescription or non-prescription medication (sedatives, stimulants, painkillers etc) before attending university?

- Yes
- No
- If "yes" which medication(s)

10. Have you ever abused any prescription or non-prescription medication after starting university?

- Yes
- No

11. Which of the following substances have you used after enrolling at the university?

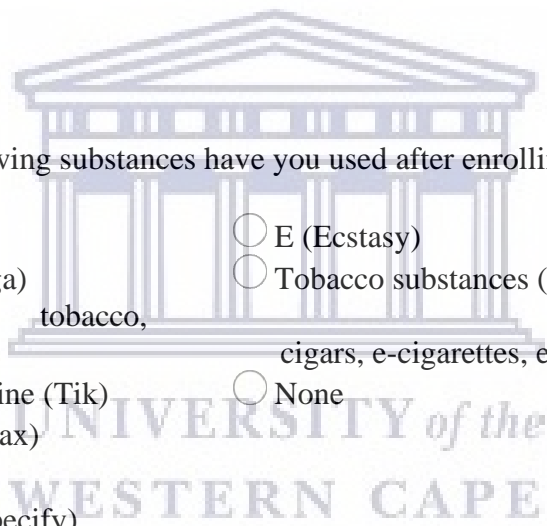
- Alcohol
- Cannabis (Dagga)
- E (Ecstasy)
- Tobacco substances (cigarettes, chewing tobacco, cigars, e-cigarettes, etc.)
- Methamphetamine (Tik)
- Buttons (Mandrax)
- Unga (Heroin)
- Other (please specify)
- None

12. Are you still using any of the substances mentioned above?

- Yes
- No
- If "yes", which substances(s)?

13. Have you ever used any type of substance on the university premises?

- Yes
- No



If "yes", which substances(s)?

14. Has your substance use increased since starting university?

Yes

No



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***The Alcohol Use Disorders Identification Test (AUDIT)***

**The Alcohol Use Disorders Identification Test: Self-Report Version**

The AUDIT questionnaire is a method of screening for excessive drinking and alcohol use disorders. It also provides a framework for intervention to help risky drinkers reduce or cease alcohol consumption and thereby avoid the harmful consequences of alcohol.

Please complete the following and where appropriate tick the applicable answer

Questions	0	1	2	3	4
How often do you have a drink containing alcohol?	Never	Monthly or less	2 - 4 times per month	2 - 3 times per week	4+ times per week
How many units of alcohol do you drink on a typical day when you are drinking?	1 -2	3 - 4	5 - 6	7 - 9	10+
How often have you had 6 or more units if female, or 8 or more if male, on a single occasion in the last year?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
How often during the last year have you failed to do what was normally expected from you because of your drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
How often during the last year have you needed an alcoholic drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
How often during the last year have you been unable to remember what happened the night before because you had been drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
Have you or somebody else been injured as a result of your drinking?	No		Yes, but not in the last year		Yes, during the last year
Has a relative or friend, doctor or other health worker been concerned about your drinking or suggested that you cut down?	No		Yes, but not in the last year		Yes, during the last year

**The Drug Use Disorders Identification Test (DUDIT)**

**Drug Use Disorders Identification Test: Self-Report Version**

The Drug Use Disorders Identification Test (DUDIT) is a screening tool developed to screen individuals for drug related problems.

Please complete the following as honestly as possible by placing a tick where applicable

Questions	0	1	2	3	4
How often do you use drugs other than alcohol?	Never	Monthly or less	2-4 times a month	2 - 3 times per week	4 or more times a week
Do you use more than one type of drug on the same occasion?	Never	Once a month or less	2-4 times a month	2 - 3 times per week	4 times a week or more
How many times do you take drugs on a typical day when you use drugs?	Never	1-2	3-4	5-6	7 or more times a week
How often are you influenced heavily by drugs?	Never	Less often than once a month	Every month	Every week	Daily or almost daily
Over the past year, have you felt that your longing for drugs was so strong that you could not resist it?	Never	Less often than once a month	Every month	Every week	Daily or almost daily
Has it happened, over the past year, that you have not been able to stop taking drugs once you started?	Never	Less often than once a month	Every month	Every week	Daily or almost daily
How often over the past year have you taken drugs and then neglected to do something you should have done?	Never	Less often than once a month	Every month	Every week	Daily or almost daily
How often over the past year have you needed to take a drug the morning after heavy drug use the day before?	Never	Less often than once a month	Every month	Every week	Daily or almost daily
How often over the past year have you had guilt feelings or a bad	Never		Yes, but not in the last year		Yes, during the last year



conscience because you used drugs?					
Have you or anyone else been hurt (mentally or physically) because you used drugs?	No		Yes, but not in the last year		Yes, during the last year
Has a relative or a friend, a doctor or a nurse, or anyone else, been worried about your drug use or said to you that you should stop using drugs?	No		Yes, but not in the last year		Yes, during the last year



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*The Perceived Stress Scale (PSS-10)*

**The Perceived Stress Scale**

**Instructions:**

The Perceived Stress Scale (PSS) is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful.

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, please indicate your response by ticking the circle representing **HOW OFTEN** you felt or thought a certain way.

Questions	Never	Almost Never	Sometimes	Fairly Often	Very Often
1. In the last month, how often have you been upset because of something that happened unexpectedly?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. In the last month, how often have you felt that you were unable to control the important things in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. In the last month, how often have you felt nervous and "stressed"?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. In the last month, how often have you felt that things were going your way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. In the last month, how often have you been able to control irritations in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. In the last month, how often have you felt that you were on top of things?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. In the last month, how often have you been angered because of things that were outside your control?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>



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WESTERN CAPE

## *The Self Reporting Questionnaire (SRQ-20)*

### **The Self Reporting Questionnaire**

The SRQ 20 was developed by the World Health Organization (WHO). It is a self-rating scale that assesses the frequency and severity of 20 symptoms related to depression and anxiety on a 0 (absent) to 1 (present) scale.

#### **Instructions:**

Please read the entire introduction before you fill in the questionnaire. It is very important that everyone taking the questionnaire follows the same instructions:

The following questions are related to certain pains and problems that may have bothered you in the last 30 days. If you think the question applies to you and you had the described problem in the last 30 days, answer YES. On the other hand, if the question does not apply to you, and you did not have the problem in the last 30 days, answer NO. If you are unsure about how to answer a question, please give the best answer you can.

We would like to reassure you that the answers you are going to provide here are confidential.

Please complete the following and where appropriate tick the applicable answer

<b>SRQ Item</b>	<b>YES</b>	<b>NO</b>
Do you often have headaches?		
Is your appetite poor?		
Do you sleep badly?		
Are you easily frightened?		
Do your hands shake?		
Do you feel nervous, tense or worried?		
Is your digestion poor?		
Do you have trouble thinking clearly?		
Do you feel unhappy?		
Do you cry more than usual?		
Do you find it difficult to enjoy your daily activities?		

Do you find it difficult to make decisions?		
Is your daily work suffering?		
Are you unable to play a useful part in life?		
Have you lost interest in things?		
Do you feel that you are a worthless person?		
Has the thought of ending your life been on your mind?		
Do you feel tired all the time?		
Are you easily tired		
Do you have uncomfortable feelings in your stomach?		

Thank you for taking the time to finish this survey. We are very appreciative of the time you have taken to assist in our research and commit to utilizing the information gained to inform worthwhile improvements in interventions aimed at addressing substance use and abuse in the university setting. We will share the results of this research endeavour with you through the university website, or it can be requested by contacting Ms Stacey Blows at 3028910@myuwc.ac.za or Dr Serena Isaacs at sisaacs@uwc.ac.za.

Once again, we are extremely grateful for your contribution.

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### *Appendix D – Referral System*

Centre for Student Support Services - UWC	021-959 2299
Pearson Counselling Unit, Durbanville	021-914 8001
Ruyterwacht	021-534 4361
Bishop Lavis	021-934 6050
Durbanville	021-444 7421/2
Goodwood	021-590 1620
Elsies River	021-931 0211
Kleinvlei	021-904 4416
Kraaifontein	021-987 0080
Parow	021-444 0918
Ravensmead	021-936 8758
Reed Street/ Kasselsvlei	021-946 3790
Belhar/St Vincent	021-953 6200
Delft	021-954 2282

