
**FREQUENCY AND BIO-DEMOGRAPHIC CORRELATES OF SUBSTANCE USE
AMONG UNDERGRADUATE STUDENTS ATTENDING A DOUBLE-MEDIUM
UNIVERSITY IN SOUTH AFRICA****Francois Steyn¹ and Brittany Hall²**

ABSTRACT

Compared to the general population, higher levels of substance use are generally considered a normalised part of student t life. This contribution adds to the limited body of knowledge on students' substance use patterns in South African contexts, specifically insofar as alcohol, tobacco, cannabis, hard drugs and prescription medication are concerned. Voluntary selection techniques were followed to gather data by means of a self-administered survey from 818 students. The use of alcohol and prescription medication featured fairly prominently among students, followed by tobacco use. A marginal proportion of students engaged in the use of hard drugs, while cannabis use prevailed as a cause for concern. In line with local and international evidence, male students presented higher levels of alcohol, tobacco and cannabis use, while female respondents appear more prone to the use of prescription medication. Significant differences in students' substance use mimic the South African realities of racial inequalities vis-à-vis socio-economic status, where White students, those from higher income groups and having attended a private school show elevated frequencies of substance use. While the General Strain Theory provides some insights into the dynamics of prescription substance use, social learning theories appear better suited to explain experimentation, socialisation and enculturation into substance use, especially so given the increase of substance use between academic year levels.

Keywords: *students; substance use; alcohol, tobacco, cannabis, hard drugs and prescription medication*

INTRODUCTION

Substance use among student populations received substantial research interest internationally. Research into student substance use received substantial attention internationally. However, there is a paucity of research on university/college students' levels of substance use and abuse in low income and developing countries as most research has focussed on adolescent or school children (Atwoli, Mungla, Ndung'u, Kinoti & Ogot, 2011: 35). The present study set out to fill this knowledge void by determining the frequency and bio-demographic correlates of substance use among undergraduate students attending a parallel- double-medium South African university.

The following review of the literature pays specific attention to the prevalence rates of substance use among students as evidenced by various international studies. Local research on South African adolescents is applied because of the implication for further substance use during young adulthood. The review briefly depicts how students generally use or abuse substances, while attention is also paid to the initiation of substance use. Various profile characteristics of student substance users are denoted, in order to situate the current study. The problems and potential dangerous effects of substance use and abuse are briefly discussed because of the social concern that the behaviour presents. Finally, a discussion on the predictors and motivations of substance use leads into the theoretical framework underpinning the behaviour.

1. Dr. Senior Lecturer. Department of Social Work and Criminology, University of Pretoria
Email: Francois.Steyn@up.ac.za

2. Ms. Department of Social Work and Criminology, University of Pretoria. Email: brittany.hall@up.ac.za

Substance use among college and university students has been a topic of interest for many researchers. Research into substance use among college and university students is an important area of study because of the implications of substance abuse for later life (Atwoli et al., 2011: 34). Studies pertaining to the cohort of college/university students have focused on, but are not limited to, areas such as the co-occurrence of alcohol and cigarette smoking (Nichter, Nichter, Carkoglu & Lloyd-Richardson, 2009; Reed, Wang, Shillington, Clapp & Lange, 2007), correlates of other substance use (Arria, Caldeira, Kasperski, O'Grady, Vincent, Griffiths & Wish, 2010), the social context associated to substance use and abuse (Beck, Arrira, Caldeira, Vincent, O'Grady & Wish, 2008) and racial and ethnic differences in drug use (McCabe, Morales, Cranford, Delva, McPherson & Boyd, 2007). Other studies highlight gender differences associated with alcohol and drug use among university students (Wagner, Stempluk, Zilberman, Barroso & De Andrade, 2007) and the general prevalence of substance use and abuse (Shah, Bazargan-Hejazi, Lindstrom & Wolf, 2009; Voigt, Work, Mittag, Goel, Voigt, Klever, Kugler, Bornstein & Bergman, 2009). Additionally, the occurrence of substance disorders and related problems have been studied (Caldeira, Arria, O'Grady, Vincent & Wish, 2008), as well as the different drug exposure opportunities and use patterns among university/college students (Arria, Caldeira, O'Grady, Vincent, Fitzelle, Johnson & Wish, 2008). Furthermore, researchers have focussed on the emerging trend of non-medical prescription drug use (Ford & Arrastia, 2008) and the academic strain associated to its initiation and prevalence (Ford & Schroeder, 2009). Socio-economic status as a predictor of tobacco, alcohol, cannabis and other illegal drug use amongst students has also received attention (Redonnet, Chollet, Fombonne, Bowes & Melchior, 2012). Research regarding substance use and abuse among the youth is not isolated to university/college students, but importantly looks at adolescent use.

The prevalence and associated correlates of substance use among high school and secondary students have received substantial attention (Reddy, Resnicow, Omardien, Bus & Kambaran, 2007) and is subsequently included in the review because it must be noted that the initiation of substance use sometimes commences during schooling years (Guxens, Nebot & Ariza, 2007). In South Africa, predictors of drug use among adolescents have been studied (Brook, Morojele, Pahl & Brook, 2006). Other African countries such as Kenya (Atwoli et al., 2011) and Nigeria (Makanjaola, Daramola & Obembe, 2007) have shown that developing countries also exhibit increasing and prevalent rates of illicit drug use among university/college student populations.

PREVALENCE OF SUBSTANCE USE AMONG STUDENTS

Internationally, there has been an increase in problematic non-medical prescription use (as a form of substance use) among the youth and young adults (Ford & Arrastia, 2008: 935,938; Ford & Schroeder, 2009: 27). Non-medical prescription drugs were found to be the most widely used substance after cannabis and alcohol (Arria et al., 2008: 33). Similarly, others have found that cannabis, followed by non-medical prescription drugs are the most widely used and abused substances among college students (McCabe et al., 2007: 81,91). Not surprisingly, there is increased social alarm about the number of youths engaging in illicit drug use (Guxens et al., 2007: 234). For example, problematic cannabis use was prevalent among 22.6 percent of a young French adult population (Redonnet et al., 2012: 233). The use of hard drugs was reported by ten percent of an American undergraduate student sample (Ford & Schroeder, 2009: 42).¹

Problematic drinking is similarly highly prevalent and problematic within student populations (Durkin, Wolfe & Clark, 2005: 255). A German study on substance use among students reported that over a third (36.5%) of males and 30.4 percent of females consumed more alcohol than the recommended daily allowance (Voigt et al., 2009: 220-221). Similarly alcohol use was prevalent across 35.8 percent of a French sample (Redonnet et al., 2012:

233). Medical students' at-risk drinking prevalence rates were additionally evidenced as being 18.1 percent (Shah et al., 2009: 144). Binge drinking was reported by 44 percent of an undergraduate student sample in the United States of America (USA) (Ford & Shroeder, 2009: 37). Therefore, it is not surprising that hazardous drinking and drug use among college students has become a public health concern (Arria et al., 2008: 19). In addition, alcohol appears to be the most prevalent substance used by adolescents (Leatherdale & Burkhalter, 2012: 319; Reddy et al., 2007: 1860). Alarming, South Africa has a higher illicit drug use rate in high schools compared to figures from the USA (Reddy et al., 2007: 1862). Prevalence rates of substance abuse among college students are also high in developing countries such as Kenya (Atwoli et al., 2011: 34) and Nigeria (Makanjaola et al., 2007: 113).

POLY-SUBSTANCE USE AMONG STUDENTS

Poly-substance use refers to the co-use of more than one substance in an effort to enhance the impact or to counteract the effect of another substance. For example, it has been found that students in the USA who illegally use prescription medication engage in significantly higher usage of alcohol and other substances (Teter, McCabe, Cranford, Boyd & Guthrie, 2010: 260). Generally the use of a substance appears to co-occur with one or more illicit or other substances. The use of tobacco and alcohol were found to coincide with the onset of cannabis use in a Spanish study (Guxens et al., 2007: 241). Moreover, the use of cannabis increases the odds of other illicit drug use by as much as 500 percent (Ford & Arrastia, 2008: 939). Additionally, the consumption of energy drinks has been found with increased levels of drug and alcohol use (Arria, Caldeira, Kasperski, O'Grady, Vincent, Griffiths & Wish, 2010: 79). The prevalence of at-risk drinking is correlated to numerous factors of substance use including the use of illegal drugs and tobacco smoking (Shah et al., 2009: 141). Generally, smoking is associated with greater alcohol consumption (Reed et al., 2007: 449). Ultimately smoking cigarettes and drinking among college students go hand in hand as they are both normalised in many student sub-cultures (Nichter et al., 2009: 16). Overall, the use of illicit drugs and non-medical prescription drugs increases the likelihood of smoking tobacco regularly (Reed et al., 2007: 460). In light of the above evidence, it is clear that students tend to engage in the use of more than one substance.

CORRELATES OF STUDENT SUBSTANCE USERS

Generally, younger individuals, students and single individuals with divorced parents are significantly more likely to exhibit higher prevalence rates for various illegal substances compared to the general young adult population (Redonnet et al., 2012: 233). There is a wide prevalence of illicit drug use among university and college students which makes them a high-risk group for substance-related problems (Voigt et al., 2008: 223; Wagner et al., 2007: 123).

The gender differences across substance use and abuse are highlighted with males exhibiting more use of psychoactive drugs than females (Redonnet et al., 2012: 233). Research shows that males generally have a higher lifetime prevalence and high frequent use rate of tobacco, cannabis and hallucinogenic drugs. Males are additionally more likely to experiment with alcohol, various inhalants and cocaine. Overall, males are more likely to report illegal substance use (Atwoli et al., 2011: 37; Makanjaola et al., 2007: 113; McCabe et al., 2007: 76; Voigt et al., 2009: 222). In addition, males tend to report smoking tobacco more so than females (Reddy et al., 2007: 1860; Voigt et al., 2009: 221). However, there is some conflicting evidence which indicates that being male decreases the reporting of illicit drug use by 27 percent (Ford & Arrastia, 2008: 938). Despite the above, females are more likely to consume amphetamines and tranquilisers (prescription medications) than their male counterparts (Wagner et al., 2007: 123, 126, 127) and therefore report less use of other illicit drugs (Voigt et al., 2009: 222). While both males and females are equally likely to

experiment with cannabis and tobacco, there are no gender differences regarding lifetime alcohol consumption, which is indicative of the closing gender gap of alcohol use (Wagner et al., 2007: 126-127). On the other hand, some research indicates that males tend to report more harmful or hazardous drinking levels, especially around the ages of 18-25 (Reddy et al., 2007: 1860; Voigt et al., 2009: 223).

Regarding race profiles, being white in Western populations is associated with a decrease in illicit drug reporting but an increase in non-medical prescription drug use. The limited use of non-medical prescription drugs among the non-White population may be attributed to differential access to health care (Ford & Arrastia, 2008: 939). Other research indicates higher rates of reporting drug use and abuse among White and Hispanic college students (McCabe et al., 2007: 75). Similarly, in a South African sample of high school students the reporting of hard drugs use was higher amongst the Black scholars than White scholars. Binge drinking and past-month cigarette smoking was higher amongst White individuals; however, smoking rates are sometimes as high or even higher within the Coloured population (Reddy et al., 2007: 1860-1861,1863). In light of the above mentioned risk factors associated to substance use, some of the general problems associated with the phenomenon are briefly noted.

PROBLEMS ASSOCIATED WITH SUBSTANCE USE AND ABUSE

There is serious cause for concern considering the wide prevalence of substance and illegal drug use considering the potential addictive behaviours and health consequences that may arise (Ford & Schroeder, 2009: 29). Alcohol, tobacco and other drug use is a source of morbidity and mortality worldwide (Reddy et al., 2007: 1859). Therefore, at-risk drinking and drug use has become a public health concern (Arria et al., 2008: 19). Consequently, the high rates of drinking and driving is a worry as it reflects that a number of young individuals put themselves and others in danger by driving while intoxicated (Beck et al., 2008: 425-426). Moreover, the use of illicit substances such as cannabis is associated with serious adverse health effects and low academic performance (Guxens et al., 2007: 234). Of concern is that a significant portion of cannabis users meet the criteria for a cannabis-related disorder (Caldeira et al., 2008: 397).²

PREDICTORS OF SUBSTANCE USE

Generally, motivations for drug use, specifically non-medical prescription drug use, among the young adult student population include the relief of pain, to experience a high, to relax or in order help meet academic standards. The use of so-called 'homework' drugs assist with concentration levels, thus allowing students to focus for longer periods of time. The use of prescription medication for academic purposes seems to be normalised in social groups on college/university campuses as the general student sub-culture's values and norms portray academic achievement as a salient goal (Ford & Schroeder, 2009: 29-30). Additionally, within the sub-culture of college/university life, it is acceptable to smoke cigarettes while drinking in social situations as they both aid in stress relief (Beck et al., 2008: 425; Nichter et al., 2009: 16-18). Smoking tobacco, drinking alcohol and the use of other drugs have all been cited as unhealthy coping strategies as a means to reduce stress amongst college students (Atwoli et al., 2011: 34; Pierceall & Kiem, 2007: 711; Shah et al., 2009: 142,146). Furthermore, they serve a function of enabling social interaction and promoting a certain social image for both males and females (Beck et al., 2008: 425; Nichter et al., 2009: 16,17,18). A noteworthy result from a study regarding academic strain was that it is not associated to the use of hard drugs, directly or indirectly (Ford & Schroeder, 2009: 26-53). The social context of substance use extends beyond the interactional and stress relief functions; socio-economic disadvantage has additionally been implicated in motivations for substance use.

A low socio-economic status has been found to be a risk for substance abuse. Specifically, the abuse of tobacco, alcohol, cannabis and other substances was found to be prevalent amongst individuals with a socio-economic disadvantage (Redonnet et al., 2012: 231). Students in an African study who were on student or governmental loans drank on average two days more than individuals who were not on student loans. The aforementioned is a possible indication of access to readily available funds being implicated in increased substance use (Atwoli et al., 2011: 38). Nonetheless, evidence indicates an inverse relationship between psychoactive substance use and socio-economic status, specifically among students and unemployed individuals (Redonnet, 2012: 233). Conversely, evidence of increased economic development in South Africa reflects increased substance use, possibly as a result of having a disposable income (Reddy et al., 2007: 1859). Accounting for the above factors a theoretical framework of the behaviour is needed to encapsulate the use of substances among university students compared to the general youth profile.

THEORETICAL FRAMEWORK

There is a significant gap in literature regarding the theoretical predictors of non-medical prescription drug and illicit drug use among students (Ford & Schroeder, 2009: 26). Subsequently, the use of substances during student years can be explained, in part, by Agnew's General Strain Theory. According to Agnew, other strain theories are class bound and thus imply lower-class deviant behaviour as a result of blocked opportunities. However, the General Strain Theory accounts for most individuals in society who will experience at least one source of strain (Brown, Esbensen & Geis, 2010: 249). Briefly, strain is experienced from a failure to achieve positively valued goals, the removal of positive valued stimuli and the presence of negative stimuli (Williams, 2012: 352-353). Ford and Schroeder (2009) found evidence in support of the theory's applicability to the student context. Specifically, students who experienced academic strain reported higher levels of depression and those with higher levels of depression indicated higher non-medical prescription drug use. There is immense pressure on students to succeed within the sub-culture's salient goal of academic achievement (Ford & Schroeder, 2009: 30).

The first source of strain for students is that the goal of academic success may be blocked or unattainable for whatever reason. Secondly, potential stressors such as conflicts within faculty administration, poor grades or financial losses may be interpreted as the removal of positive stimuli for a student. Finally, the presence of negative stimuli may be considered as poor grades, abuse by peers and/or overly harsh faculty members (Ford & Schroeder, 2009: 31). The student academic lifestyle is thus implicated in substance use as students attempt to reduce stress associated with various academic demands (Shah et al., 2009: 142,146). Hence, academic strain can be experienced by members of any class in society and is specifically applicable to the college/university environment.

Despite college and university life being a period of experimentation (Reed et al., 2007: 461), studies show that substance abuse, especially alcohol abuse, among young adults is sometimes established in adolescent years (Leatherdale & Burkhalter, 2012: 318). To explain the social context of substance use and abuse, the social dynamics outside of strain are henceforth considered. Akers' Social Learning Theory, which focusses on the impact of normalisation and socialisation, can be applied to explain the initiation of substance use amongst adolescents and young adults. The theory postulates that causal mechanisms which explain deviant behaviour involve interactions with primary group members, such as family and friends (Ford & Arrastia, 2008: 936). Evidently, being exposed and introduced to substances and other illicit drugs during school or university is commonly achieved through one's peer group or extended relatives (Brook et al., 2006: 31). The four key elements of the Social Learning Theory, particularly differential associations (social interactions), definitions (attitudes), differential reinforcement (consequences) and imitation, help explain how

behaviour (criminal and conforming) is shaped (Brown et al., 2010: 282). Aker's Social Learning Theory incorporates aspects from the Differential Association Theory and therefore implies that the same processes are involved in learning both conforming and deviant behaviours (Siegel, 2010: 222). The abovementioned elements are part of a complex learning process and certain behaviours, such as substance use, can be explained when personal definitions are favourable for such behaviour and the behaviour has been differentially reinforced (Brown et al., 2010: 283). Hence the social context of school and college/university life is implicated in the initiation and continuation of substance use behaviours.

The Social Learning Theory has been successfully used to explain deviant behaviour such as cannabis use among youths (Brauer, 2009: 929). One study conducted in Spain indicated that predictors associated with cannabis use in schools include drug use amongst friends. The social modelling of substance use is implicated in adolescent years while more cognitive intentions to use substances are found in later years (Guxens et al., 2007: 239). In addition, the role of social modelling has been implicated in South African research evidencing that deviant peers contribute the adolescents' likelihood of using illegal drugs (Brook et al, 2006: 31). Other African research has shown that just over 75 percent of students who reported using drugs were introduced to it by a friend (Atwoli et al., 2011: 34). Furthermore, significant predictors of student binge-drinking included the differential peer associations, favourable definitions and perceptions of the direct effects of the behaviour as indicated by Durkin et al (2005). Ultimately there is evidence to support that personal attributes, such as beliefs and attitudes, as well as peer domains have a strong relationship with youth drug use (Brook et al., 2006: 31).

Further research indicates that exposure to and opportunities to use various substances are more apparent in the early years of college/university, with a progression from soft to harder drugs. Specifically, exposure to various illicit substances coincides with the transition from high school to university, while other patterns reflect a continuation from use in high school. Exposure to and use of hard drugs such as cocaine and various hallucinogens is more prevalent in the first two years of college. Generally, the use of certain hard drugs ceases in later college years (Arria et al., 2008: 29-30, 33). Additionally, at-risk drinking shows a slight decrease among third and fourth year medical students compared to first and second year students (Shah et al., 2009: 146). Therefore, whether a deviant act, such as substance use, will be committed depends on the whether the opportunity presents itself in the social context and coincides with the individuals learning history, favourable definitions for the behaviour, as well as perceptions regarding the implications.

RESEARCH METHODS

The study followed quantitative principles in generating numeric data about undergraduate students' substance use, in order to examine relationships between frequency of use and the bio-demographic characteristics of respondents (Creswell, 2014: 4). A descriptive research purpose was adopted, in order to systematically and in detail describe the background characteristics and patterns of substance use among students (Hagan, 2010: 124). To facilitate quantification, a correlational survey design was used since the aim was to determine statistically significant correlations between the substance use of students and their background characteristics (Dantzker & Hunter, 2012: 87). Although probability sampling methods could have been employed to select a representative sample of undergraduate students, the researchers decided on non-probability procedures in light of the logistical challenges associated with selecting and informing students, accompanied by arrangements for venues and the possibility of a number of students not showing up for the survey. Instead, the non-probability strategy of voluntary sampling was used due to cost and time concerns (Babbie, 2011: 199; Strydom & Delpont, 2011: 394).

A questionnaire was designed which contained closed-ended questions on students' bio-demographic characteristics, as well as a table to record the frequency of substance use on a scale with the categories "often", "sometimes", "seldom" and "never". To strengthen the validity of the research instrument, questions were kept short and easily understandable. The questionnaire was piloted among 54 students not enrolled in the particular discipline after which minor changes were made to the phrasing of some questions (Hagan, 2010: 129). It was taken that students would be more honest and forthcoming when asked personal questions about their use of substances when a self-administered data gathering strategy was used (Dantzker & Hunter, 2012: 124; Delpont & Roestenburg, 2011: 189). A drawback of this strategy was that the researchers could not control the quality of data, especially the completeness of questionnaires, while little opportunity existed to explain questions to individual respondents in cases of misunderstanding questions.

The structured lecture times of a specific academic discipline were used as opportunity to gather data from students who attended classes in English and Afrikaans. Having made arrangements with the lecturers, the researchers visited each of the six undergraduate classes and explained the purpose and procedures of the study to the students (Kumar, 2005: 129). The questionnaire was handed out in class together with a separate letter of informed consent and a pamphlet with the contact particulars of professionals whom respondents could contact should they be concerned about their own or someone else's misuse of substances. Respondents were instructed not to discuss the questions or their answers, and to fold their completed questionnaires twice so that fellow-students could not see their responses during collection. A total of 818 questionnaires were completed during the six data gathering opportunities, with eight students having declined to participate in the survey.

The completed questionnaires were firstly kept separate by year level and language of tuition for which unique codes were created. Thereafter, each questionnaire was manually coded and captured in Microsoft Excel (Newton & Rudestam, 2013: 25). The complete dataset was imported to and analysed using the Statistical Package for the Social Sciences (IBM, 2015). In addition to descriptive outputs in the form of frequency distributions (Tables 1-3) and cross-tabulations (Tables 5-9, which are attached as appendices to the article), relationships between bio-demographic characteristics and substance use were tested by means of the Mann-Whitney *U* and Kruskal-Wallis *H* tests (Table 4). These tests had to be used since inspection of the histograms with normality curves and the Kolmogorov-Smirnov test showed that, despite the large number of respondents, the data was not normally distributed (Field, 2009: 788). The mean ranks (MR) of statistical outcomes are presented together with the *p*-values to validate the interpretation of significant associations and differences among the bio-demographic variables and substance use of respondents.

The study adhered to the standard ethical considerations when obtaining data from human subjects (Strydom, 2011: 120), including anonymity which could be guaranteed because of the group-setting in which the self-administered survey took place (Davies, Francis & Jupp, 2011: 153). As mentioned, respondents signed an informed consent form and could withdraw from the survey at any time. Potential harm was counteracted with the information pamphlet on potential substance misuse and addiction, and all respondents had personal, telephone and email access to the researchers. The study was approved by the faculty's research ethics committee and the registrar of the university.

RESULTS

Analysis of the respondents' bio-demographic data revealed important insights which have important implications in the interpretation of results. In terms of gender, there were more male ($n=26$; 14.1%) than female ($n=44$; 7.0%) respondents from low income backgrounds (male MR = 381.5, female MR 413.8, $p = 0.032$). Similarly, disproportionately more male

(n=98; 53.0%) compared to female (n=267; 42.4%) respondents were in the first year level (male MR = 379.6, female MR = 416.3, $p = 0.045$). As can be expected, nearly all respondents from low economic backgrounds (n=69; 95.8%) attended public schools while more than half of those from high economic backgrounds (n=69; 54.8%) attended private schools (public school MR = 374.4, private school MR = 478.0, $p < 0.001$). Lastly, the sample mimicked the South African reality of African respondents (n=53; 21.9%) being significantly more likely to come from low income backgrounds compared to White respondents (n=14; 2.8%) (African MR = 337.4, White MR = 441.8, $p < 0.001$).

The mean age of respondents was 20.38 years with a standard deviation of 2.19 years. The greater proportion of respondents was female and students from middle-income backgrounds, while African respondents and those who attended private schools made up slightly less than a third of the sample (Table 1).

Table 1: Biographic characteristics of respondents

| | n | % |
|---------------------------------|-----|------|
| Gender: | | |
| Male | 185 | 22.7 |
| Female | 630 | 77.3 |
| Population group: | | |
| African | 244 | 29.8 |
| Coloured | 48 | 5.9 |
| Indian/Asian | 28 | 3.4 |
| White | 499 | 60.9 |
| Economic background: | | |
| Low income | 72 | 8.8 |
| Middle income | 616 | 75.6 |
| High income | 127 | 15.6 |
| Type of school attended: | | |
| Public | 567 | 69.7 |
| Private | 247 | 30.3 |
| Academic year: | | |
| First year | 365 | 44.6 |
| Second year | 230 | 28.1 |
| Third year | 224 | 27.4 |

Nearly half of all respondents were in their first academic year and roughly one in four were in their second or third academic year (Table 2). Although the home language of respondents was not recorded, more than two-thirds attended the English classes. In light of Table 2 – and based on the researchers' lecturing experience – it can be deduced that a large number of White students prefer to attend the English classes.

Table 2: Tuition language per year level of respondents³

| | English | | Afrikaans | | Total | |
|-------------|---------|------|-----------|------|-------|-------|
| | n | % | n | % | n | % |
| First year | 277 | 33.8 | 128 | 15.6 | 405 | 49.5 |
| Second year | 178 | 21.8 | 44 | 5.4 | 222 | 27.1 |
| Third year | 126 | 15.4 | 65 | 7.9 | 191 | 23.3 |
| Total | 581 | 71.0 | 237 | 29.0 | 818 | 100.0 |

When combining the “often” and “sometimes” categories in terms of respondents’ frequency of substance use, alcohol featured predominantly (52.0%) followed by prescription medication (38.1%) and tobacco use (17.0%) (Table 3). One in twelve respondents (8.3%) replied “often” and “sometimes” to using cannabis, while twelve respondents (1.5%) indicated using hard drugs. Cannabis use showed the highest frequency in the “seldom” category, suggesting that the substance is used occasionally.

Table 3: Frequency of respondents’ substance use

| | Often | | Sometimes | | Seldom | | Never | |
|--------------------------|-------|------|-----------|------|--------|------|-------|------|
| | n | % | n | % | n | % | n | % |
| Alcohol | 148 | 18.5 | 268 | 33.5 | 230 | 28.8 | 154 | 19.3 |
| Tobacco | 88 | 11.4 | 49 | 6.3 | 77 | 9.9 | 560 | 72.4 |
| Cannabis | 29 | 3.8 | 35 | 4.5 | 117 | 15.2 | 590 | 76.5 |
| Hard drugs | 1 | 0.1 | 4 | 0.5 | 7 | 0.9 | 749 | 98.4 |
| Prescriptions medication | 138 | 17.6 | 161 | 20.5 | 270 | 34.4 | 215 | 27.4 |

Of the five substances researched, alcohol showed the greatest significant variations across bio-demographic variables (Tables 4 and 5). The results show that White (n=113; 23.0%) and male (n=48; 26.7%) respondents, as well as those from high income backgrounds (n=33; 26.8%), having attended a private school (n=62; 25.7%) and in their third academic year (n=53; 24.8%) are significantly more likely to “often” use alcohol. African (35.2%) and Indian/Asian (32.1%) respondents, as well as those from low income backgrounds (n=27; 39.7%) were more likely to report “never” using alcohol. In the “often” category, it appears that alcohol use increased from first (n=63; 17.6%) and second (n=32; 14.0%) year levels to nearly one in four respondents (n=53; 24.8%) who are in their third year of study. Conversely, one in five (n=78; 21.8%) first year respondents replied “never” to alcohol use compared to one in seven (n=30; 14.0%) third year respondents.

The survey indicates that African (n=190; 84.8%) and Indian/Asian (n=23; 85.2%) respondents were significantly more likely to “never” use tobacco compared to Coloured (n=30; 65.2%) and White (n=317; 66.5%) respondents (Tables 4 and 6). Tobacco use increased roughly three-fold between first (n=24; 6.9%) and third (n=37; 18.0%) year respondents. Cannabis use appeared more pronounced among male (n=14; 7.9%) than female (n=15; 2.5%) respondents in the “often” category (Tables 4 and 7).

Table 4: Inferential analyses of substance use by background characteristics of respondents

| | Alcohol | | | Tobacco | | | Cannabis | | |
|--------------------|---------|-------|-------|---------|-------|-------|----------|-------|-------|
| | n | MR | p | n | MR | p | n | MR | p |
| †Gender: | | | | | | | | | |
| Male | 180 | 358.9 | .006* | 176 | 363.4 | 0.57 | 177 | 350.0 | .002* |
| Female | 616 | 410.0 | | 594 | 392.0 | | 590 | 394.1 | |
| ‡Population group: | | | | | | | | | |
| African | 233 | 485.7 | .000* | 224 | 440.1 | .000* | 226 | 407.3 | .013* |
| Coloured | 47 | 407.8 | | 46 | 358.1 | | 46 | 327.5 | |
| Indian/Asian | 28 | 471.6 | | 27 | 440.1 | | 27 | 410.5 | |
| White | 492 | 355.3 | | 477 | 362.6 | | 472 | 380.0 | |
| ‡Economic status: | | | | | | | | | |
| Low income | 68 | 517.9 | .000* | 67 | 425.8 | .125 | 66 | 402.8 | .620 |
| Middle income | 605 | 396.3 | | 582 | 383.2 | | 583 | 382.0 | |
| High income | 123 | 342.9 | | 121 | 374.2 | | 118 | 383.2 | |

| | | | | | | | | | |
|---|-------------------|-----------|----------|-------------------------|-----------|----------|-----|-------|-------|
| † Type of school: | | | | | | | | | |
| Public | 554 | 417.2 | .000* | 540 | 387.1 | .607 | 538 | 398.0 | .000* |
| Private | 241 | 353.8 | | 229 | 380.0 | | 228 | 349.1 | |
| ‡ Academic year: | | | | | | | | | |
| First year | 358 | 415.0 | .018* | 350 | 409.8 | .000* | 348 | 386.3 | .466 |
| Second year | 228 | 412.1 | | 219 | 389.0 | | 220 | 395.2 | |
| Third year | 214 | 363.7 | | 205 | 347.7 | | 203 | 375.4 | |
| † Tuition language: | | | | | | | | | |
| Afrikaans | 234 | 382.8 | .160 | 229 | 375.1 | .223 | 226 | 430.1 | .000* |
| English | 565 | 407.1 | | 544 | 391.9 | | 544 | 366.9 | |
| | Hard drugs | | | Prescription med | | | | | |
| | n | MR | p | n | MR | p | | | |
| † Gender: | | | | | | | | | |
| Male | 177 | 374.2 | .129 | 176 | 453.5 | .000* | | | |
| Female | 580 | 380.4 | | 604 | 372.1 | | | | |
| ‡ Population group: | | | | | | | | | |
| African | 223 | 387.0 | .069 | 230 | 422.0 | 0.74 | | | |
| Coloured | 45 | 370.0 | | 46 | 399.2 | | | | |
| Indian/Asian | 27 | 373.0 | | 27 | 409.3 | | | | |
| White | 166 | 379.6 | | 481 | 376.7 | | | | |
| ‡ Economic status: | | | | | | | | | |
| Low income | 67 | 373.6 | .091 | 67 | 450.5 | .055 | | | |
| Middle income | 578 | 381.0 | | 596 | 386.4 | | | | |
| High income | 112 | 371.4 | | 117 | 376.9 | | | | |
| † Type of school: | | | | | | | | | |
| Public | 533 | 379.0 | .621 | 547 | 387.8 | .673 | | | |
| Private | 223 | 377.2 | | 232 | 395.0 | | | | |
| ‡ Academic year: | | | | | | | | | |
| First year | 344 | 381.4 | .430 | 353 | 386.3 | .643 | | | |
| Second year | 216 | 383.4 | | 221 | 391.3 | | | | |
| Third year | 201 | 377.5 | | 210 | 404.0 | | | | |
| † Tuition language: | | | | | | | | | |
| Afrikaans | 223 | 384.8 | .106 | 228 | 374.6 | .152 | | | |
| English | 537 | 378.7 | | 555 | 399.1 | | | | |
| † Mann-Whitney U ‡ Kruskal-Wallis H * Significant at $p < 0.05$ | | | | | | | | | |

The highest frequency of cannabis use for African (n=23; 10.2%), Coloured (n=8; 17.4%) and White (86; 18.2%) respondents featured in the “seldom” category. Respondents who attended private schools showed higher frequencies of cannabis use in the “sometimes” (n=19; 8.3%) and “seldom” (n=48; 21.1%) categories compared to those who attended public schools [“sometimes” (n=16; 3.0%) and “seldom” (n=69; 12.8%)]. Across all four categories, cannabis use was significantly higher among respondents who attended class in English (Table 7).

As indicated above, the use of hard drugs appeared very low and, therefore, the data does not reveal any meaningful insights into bio-demographic correlates (Tables 4 and 8). A tentative interpretation is that the use of hard drugs featured more among White (8 of 12) respondents and those from middle and high income backgrounds (10 of 12). The only significant association that featured in terms of the use of prescription medication was that female respondents (n=120; 19.9%) were more likely than their male counterparts (n=16; 10.2%) to “often” use such substances (Tables 4 and 9). Conversely, male respondents (n=66; 37.5%) were more likely to have replied “never” to the use of prescription medication compared to female respondents (n=147; 24.3%). Although not significant, the use of

prescription medication in the “often” category among respondents from high income backgrounds (n=24; 20.5%) was nearly double that of respondents from low income backgrounds (n=7; 10.4%).

DISCUSSION

Students represent one of the populations which exhibit higher prevalence rates for legal and illegal substance use compared to the general young adult population (Redonnet et al., 2012: 233). Elevated rates of substance use places students at higher risk for substance-related problems (Voigt et al., 2008: 223; Wagner et al., 2007: 123). The present study set out to determine the frequency and bio-demographic correlates of substance use among students attending a South African university. From a broad perspective, four in five students (80.7%) reported using alcohol, with nearly one in five (18.2%) using alcohol often which is similar to evidence from a study among students in Germany (Shah et al., 2009: 144). Tobacco use, predominantly through smoking, was reported by one in four students (27.6%). Both alcohol and tobacco use is not an illegal activity although its sale is restricted in terms of age where it is against the law for persons younger than 18 years to buy such products. Most students at institutions of higher education recently left school and, perhaps not surprisingly, indulge in adult privileges such as smoking and drinking which was previously denied them because of their age. Smoking and drinking go hand in hand as they are both normalised as part of student sub-cultures (Nichter et al., 2009: 16). In terms of the gateway model (Siegel, 2006: 469), the use of these normalised substances could lead to dangerous patterns of substance use and experimentation and habitual use of other substances.

While the frequency of using hard drugs among students was low (1.7%) – compared to the 10% recorded by an American study (Ford & Schroeder, 2009: 42) – it is of concern that one in four students (23.5%) reported using cannabis. Infrequent use of cannabis was reported by one in five respondents (19.7%). The use of illicit substances such as cannabis is associated with serious adverse health effects and low academic performance (Guxens et al., 2007: 234). The use of prescription medication appears high (72.6%), although it must be born in mind that such substances are prescribed by a doctor or dispensed by a pharmacist for a variety of health reasons.

The survey confirms trends in the biographic make-up of substance users. Males generally present more harmful or hazardous drinking levels around the ages of 18-25, which is typically the age group of undergraduate students (Reddy et al, 2007: 1860; Voigt et al, 2009: 223). Male students in the present study were significantly more likely to present higher levels of alcohol and cannabis use compared to their female counterparts. Although a significant difference did not feature, it was found that male students reported higher levels of tobacco use (33.5%) than female students (26.1%). As found elsewhere (Wagner et al., 2007: 123), female students appeared significantly more likely to use prescription medication compared to male students.

The literature on socio-economic status and substance use provides contradicting evidence. While some studies found more pronounced associations between the used tobacco, alcohol, cannabis and other substances among low-socio-economic groups (Redonnet et al., 2012: 231), others claim that increases in disposable income facilitate higher levels of substance use (Reddy et al., 2007: 1859), including student populations with financial support (Atwoli et al., 2011: 38). The present study aligns more with the latter view since students from high income backgrounds presented significantly higher levels of alcohol use compared to those from middle and low income backgrounds. In addition, students from higher income homes showed higher frequencies than the other income groups in terms of often using tobacco, cannabis and prescription medication. This observation is further supported by the finding that students who have attended private schools – generally viewed as being economically privileged – showed significantly higher levels of alcohol and cannabis use.

In South African contexts, discussions about socio-economic status cannot be separated from those of racial inequalities. As indicated, African students were significantly more likely than Whites to come from low economic backgrounds and that White students dominated the high income sample. Tied to the observations above and confirming existing evidence (Ford & Arrastia, 2008: 939), the results confirm that the use of prescription medication appears lower in non-White population groups. In fact, White students in the present study showed higher levels of often using alcohol and prescription medication compared to African, Coloured and Indian/Asian students, and second highest overall use of tobacco and cannabis. Similar to other research (Reddy et al., 2007: 1860-1861), Coloured students presented the highest rate of using tobacco. In addition, Coloured students outranked the other population groups in terms of cannabis use.

The General Strain Theory proposes that students may turn to substances as a response to the pressures brought about by expectations of academic achievement and the presence of negative stimuli, such as financial and material constraints. Some students could, therefore, experience depression hence the need for prescription medication (Ford & Schroeder, 2009: 30). These products could assist students in focusing while studying or counteract the anxieties associated with times of academic stress (i.e. test weeks and exams) (Advokat, Guidry & Martino, 2008: 601). Alternatively, the stress of the student academic lifestyle may cause students to use substances as a way to cope with the educational strains they experience (Beck et al, 2008: 425; Shah et al., 2009: 142,146). However, the General Strain Theory has difficulty explaining significant differences in students' substance use across bio-demographic characteristics, which suggests distinct trajectories toward substance use.

Following directly after school for most students, college and university life continues as a period of experimentation (Reed et al., 2007: 461). Also, in the context of the normalisation of substance use as part of student sub-cultures (Nichter et al., 2009: 16), such behaviour could result from the causal mechanisms of interactions with primary group members, here fellow students (Ford & Arrastia, 2008: 936). By means of a process of socialisation and enculturation, students may well be introduced to using the substances associated with student life. Substance use may well be strengthened through social interactions with peers and the modelling and reinforcement of substance use behaviour, thus promoting positive attitudes toward such practices (Brown et al., 2010: 282). However, while it has been suggested that substance use occurs in early college years (Arria et al., 2008: 29; Shah et al., 2009: 146), findings from the present survey advocates otherwise: alcohol, tobacco and cannabis use show higher frequencies between first and third year students. It is argued here that increases in the prevalence of substance use could be attributed to the same processes of social learning, exposure and enculturation discussed above. The finding is worrisome as it has implications for continued substance use in post-university adult life.

In conclusion, the results of the survey confirm the reality of undergraduate students using alcohol, tobacco, cannabis, prescription medication and hard drugs, albeit to various extents. Institutions of higher learning are advised to take cognisance of this reality and invest resources toward the monitoring of students' levels of substance use vis-à-vis the potential detrimental impact of such behaviours on personal and academic outcomes. Continuous, student-sensitive awareness campaigns ought to be developed and communicated to student profiles that appear more at risk of substance use problems.

LIMITATIONS AND FUTURE RESEARCH

The bias inherent to measuring substance use by means of self-report strategies is acknowledged. It is generally accepted that people under-report on their levels of problem or deviant behaviour, regardless of assurances of anonymity. In addition, the survey made use of non-probability sampling procedures which limits the generalisability of the results to other

settings. Future research should make use of random samples and should preferably include samples from different faculties to detect further potential nuances in students' substance use and related correlates. Measuring substance use with more detailed measures, for example in terms of the types and volumes of substances is also needed. Research is needed to explain the progression of substance use across academic year levels in the South African context. Lastly, the use and potential misuse of prescription medication among students warrant more in-depth investigation.

ENDNOTES:

1. Similar to the study by Ford and Schroeder (2009: 36), the present study clustered substances such as cocaine, heroin and methamphetamine into the category "hard drugs". The authors are fully aware of the limitations inherent to such categorisation because of the differential dynamics associated with each of the substances. The decision to simply refer to "hard drugs" was made in light of the research method opted for, specifically time concerns of completing the survey during formal lecture time. Examples of "hard drugs" were included in the questionnaire in order for respondents to better understand the concept.
2. Cannabis can be used on its own or in combination with other drugs. For example, *nyaope* or *whoonga* is a local illegal substance produced by combining various household chemicals, illicit substances (methamphetamine or heroin), antiretroviral medication and cannabis (*cf.* Grelotti, Closson, Smit, Mabude, Matthews, Safren, Bangsberg & Mimiaga, 2014). The present study did not differentiate as to whether respondents used cannabis on its own or in combination with other drugs.
3. The discrepancies regarding the year-levels of respondents between Table 1 and Table 2 is attributed to students reporting on either their chronological academic year or the year level of the modules they were enrolled in. For example, some students may have been in their second chronological year but are repeating the first year module. Table 2 was calculated on the actual number of completed questionnaires per module and tuition language.

LIST OF REFERENCES

- Advokat, C.D., Guidry, D. & Martino, L. 2008. Licit and illicit use of medications for attention-deficit hyperactivity disorder in undergraduate college students. *Journal of American College Health*, 56(6): 601-606.
- Arria, A.M., Caldeira, K.M., Kasperski, S.J., O'Grady, K.E., Vincent, K.B., Griffiths, R.R. & Wish, E.D. 2010. Increased alcohol consumption, nonmedical prescription drug use, and illicit drug use are associated with energy drink consumption among college students. *Journal of Addiction Medicine*, 4(2): 74-80.
- Arria, A.M., Caldeira, K.M., O'Grady, K.E., Vincent, K.B., Fitzelle, D.B., Johnson, E.P. & Wish, E.D. 2008. Drug exposure opportunities and abuse patterns among college students: Results of a longitudinal prospective cohort study. *Substance Abuse*, 29(4): 19-38.
- Atwoli, L., Mungla, 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: 34-42.
- Babbie, E. 2011. *The basics of social research*. Belmont, CA: Wadsworth Cengage Learning.
- Beck, K.H., Arria, A.M., Caldeira, K.M., Vincent, K.B., O'Grady, K.E. & Wish, E.D. 2008. Social context of drinking and alcohol problems among college students. *American Journal of Health Behaviour*, 32(4): 420-430.
- Brauer, J.R. 2009. Testing Social Learning Theory using reinforcement's residue: A multilevel analysis of self-reported marijuana use in the national youth survey. *Criminology*, 47: 929-970.
- Brook, J.S., Morojele, N.K., Pahl, K. & Brook, D.W. 2006. Predictors of drug use among South African adolescents. *Journal of Adolescent Health*, 38: 26-34.
- Brown, S.E., Esbensen, F. & Geis, G. 2010. *Criminology: Explaining crime and its context*. 7th ed. New Providence: Anderson Publishing.
- Caldeira, K.M., Arria, A.M., O'Grady, K.E., Vincent, K.B. & Wish, E.D. 2008. The occurrence of cannabis use disorders and other cannabis-related problems among first-year college students. *Addictive Behaviours*, 33: 397-411.

- Creswell, J.W. 2014. *Research design: qualitative, quantitative & mixed methods approaches*. 4th ed. London: Sage.
- Dantzker, M.L. & Hunter, R.D. 2012. *Research methods for criminology and criminal justice*. Sudbury, MA: Jones & Bartlett Learning.
- Davies, P., Francis, P. & Jupp, V. 2011. *Doing criminological research*. 2nd ed. London: Sage.
- Delpont, C.S.L. & Roestenburg, W.J.H. 2011. Quantitative data collection methods: questionnaires, checklists, structured observation and structured interview schedules. In A.S. de Vos, H. Strydom, C.B. Fouché & C.S.L. Delpont, *Research at grass roots for the social sciences and human service professions* (4th edition). Pretoria: Van Schaik.
- Durkin, K.E., Wolfe, T.E. & Clark, G.A. 2005. College students and binge drinking: An evaluation of the Social Learning Theory. *Sociological Spectrum*, 25: 255-272.
- Field, A. 2009. *Discovering statistics using SPSS*. 3rd ed. Los Angeles: Sage.
- Ford, J.A. & Arrastia, M.C. 2008. Pill-poppers and dopers: A comparison of non-medical prescription drug use and illicit/street drug use among college students. *Addictive Behaviours*, 33: 934-941.
- Ford, J.A. & Schroeder, R.D. 2009. Academic strain and non-medical use of prescription stimulants among college student. *Deviant Behaviour*, 30: 26-53.
- Grelotti, D.J., Closson, E.F., Smit, J.A., Mabude, Z., Matthews, L.T., Safren, S.A., Bangsberg, D.R. & Mimiaga, M.J. 2014. Whoonga: Potential Recreational Use of HIV Antiretroviral Medication in South Africa. *AIDS and Behavior*, 18(3): 511-518.
- Guxens, M., Nebot, M. & Ariza, C. 2007. Age and sex differences in factors associated with the onset of cannabis use: a cohort study. *Drug and Alcohol Dependence*, 88: 234-243.
- Hagan, F.E. 2010. *Research methods in criminal justice and criminology*. 8th ed. Upper Saddle River, New Jersey: Pearson.
- IBM Corp. 2015. *IBM SPSS Statistics for Windows, Version 23*. Armonk, NY: IBM Corp.
- Kumar, R. 2005. *Research methodology: a step-by-step guide for beginners*. 2nd ed. London: Sage.
- Kumar, R. 2005. *Research methodology: A step-by-step guide for beginners*. 2nd ed. London: SAGE.
- Leatherdale, S.T. & Burkhalter, R. 2012. The substance use profile of Canadian youth: Exploring the prevalence of alcohol, drug and tobacco use by gender and grade. *Addictive Behaviours*, 37: 318-322.
- Makanjaola, A.B., Daramola, T.O. & Obembe, A.O. 2007. Psychoactive substance use among medical students in a Nigerian university. *World Psychiatry*, 6(2): 112-114.
- McCabe, S.E., Morales, M., Cranford, J.A., Delva, J., McPherson, M.D. & Boyd, C.J. 2007. Race/Ethnicity and gender differences in drug use and abuse among college students. *Journal of Ethnicity on Substance Abuse*, 6(2): 75-95.
- Newton, R.R. & Rudestam, K.E. 2013. *Your statistical consultant: answers to your data analysis questions*. 2nd edition. Thousand Oaks, CA: Sage.
- Nichter, M., Nichter, M., Carkoglu, A. & Lloyd-Richardson, E. 2009. Smoking and drinking among college students: "It's a package deal". *Drug and Alcohol Dependence*, 106: 16-20.
- Pierceall, E.A. & Keim, M.C. 2007. Stress and coping strategies among community college students. *Community College Journal of Research and Practice*, 31: 703-712.
- Reddy, P., Resnicow, K., Ouardien, R., Bus, B. & 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.
- Redonnet, B., Chollet, A., Fombonne, E., Bowes, L. & Melchior, M. 2012. Tobacco, alcohol, cannabis and other illegal drug use among young adults: The socio-economic context. *Drug and Alcohol Dependence*, 121: 231-239.
- Reed, M.B., Wang, R., Shillington, A.M. Clapp, J.D. & Lange, J.E. 2007. The relationship between alcohol use and cigarette smoking in a sample of undergraduate college students. *Addictive Behaviours*, 32: 449-464.
- Shah, A.A., Bazargan-Hejazi, S., Lindstrom, R.W. & Wolf, K.E. 2009. Prevalence of at-risk drinking among a national sample of medical students. *Substance Abuse*, 30(2): 141-149.
- Siegel, L.J. 2006. *Criminology*. Toronto: Wadsworth.
- Siegel, L.J. 2010. *Criminology: Theories, Patterns and Typologies*. 10th ed. Belmont: Wadsworth, Cengage Learning.

- Strydom, H. & Delpont, C.S.L. 2011. Sampling and pilot study in qualitative research. In De Vos, A.S., Strydom, H., Fouché C.B. & Delpont, C.S.L. *Research at grass roots for the social sciences and human service professions*. 4th ed. Pretoria: Van Schaik.
- Strydom, H. 2011. Ethic aspects of research in the social sciences and human service professions. In De Vos, A.S., Strydom, H., Fouché C.B. & Delpont, C.S.L. *Research at grass roots for the social sciences and human service professions*. 4th ed. Pretoria: Van Schaik.
- Teter, C.J., McCabe, S.E., Cranford, J.A., Boyd, C.J. & Guthrie, S.K. 2010. Prevalence and motives for illicit use of prescription stimulants in an undergraduate student sample. *Journal of American College Health*, 53(6): 253-262.
- Voigt, K., Work, S.T., Mittag, D., Goberl, A., Voigt, R., Klever, J., Kugler, J., Bornstein, S.R. & Bergman, A. 2009. Consumption of alcohol, cigarettes and illegal substances among physicians and medical students in Brandenburg and Saxony (Germany). *BMC Health Services Research*, 9: 219-226.
- Wagner, G.A., Stempluk, V.D., Zilberman, M.L., Barroso, L.P. & De Andrade, A.G. 2007. Alcohol and drug use among university students: Gender differences. *Revista Brasileira de Psiquiatria*, 29(2): 123-129.
- Williams, K.S. 2012. *Textbook on Criminology*. 7th ed. Oxford: Oxford University Press.

Table 5: Cross-tabulation of alcohol use and background characteristics of respondents

| | Often | | Sometimes | | Seldom | | Never | |
|-------------------|-------|------|-----------|------|--------|------|-------|------|
| | n | % | n | % | n | % | n | % |
| Gender: Male | 48 | 26.7 | 59 | 32.8 | 43 | 23.9 | 30 | 16.7 |
| Female | 100 | 16.2 | 208 | 33.6 | 186 | 30.2 | 122 | 19.8 |
| Population group: | | | | | | | | |
| African | 24 | 10.3 | 62 | 26.6 | 65 | 27.9 | 82 | 35.2 |
| Coloured | 9 | 19.1 | 13 | 27.7 | 17 | 36.2 | 8 | 17.0 |
| Indian/Asian | 2 | 7.1 | 10 | 35.7 | 7 | 25.0 | 9 | 32.1 |
| White | 113 | 23.0 | 183 | 37.7 | 141 | 28.7 | 55 | 11.2 |
| Economic status: | | | | | | | | |
| Low income | 6 | 8.8 | 13 | 19.1 | 22 | 32.4 | 27 | 39.7 |
| Middle income | 108 | 17.9 | 213 | 35.2 | 172 | 28.4 | 112 | 18.5 |
| High income | 33 | 26.8 | 42 | 34.1 | 35 | 28.5 | 13 | 10.6 |
| Type of school: | | | | | | | | |
| Public | 84 | 15.2 | 180 | 32.5 | 177 | 31.9 | 113 | 20.4 |
| Private | 62 | 25.7 | 87 | 36.1 | 51 | 21.2 | 41 | 17.0 |
| Academic year: | | | | | | | | |
| First year | 63 | 17.6 | 112 | 31.3 | 105 | 29.3 | 78 | 21.8 |
| Second year | 32 | 14.0 | 86 | 37.7 | 64 | 28.1 | 46 | 20.2 |
| Third year | 53 | 24.8 | 70 | 32.7 | 61 | 28.5 | 30 | 14.0 |
| Tuition language: | | | | | | | | |
| Afrikaans | 41 | 17.5 | 85 | 36.3 | 81 | 34.6 | 27 | 11.5 |
| English | 107 | 18.9 | 183 | 32.4 | 148 | 26.2 | 127 | 22.5 |

Table 6: Cross-tabulation of tobacco use and background characteristics of respondents

| | Often | | Sometimes | | Seldom | | Never | |
|-------------------|-------|------|-----------|-----|--------|------|-------|------|
| | n | % | n | % | n | % | n | % |
| Gender: Male | 24 | 13.6 | 14 | 8.0 | 21 | 11.9 | 117 | 66.5 |
| Female | 64 | 10.8 | 35 | 5.9 | 56 | 9.4 | 439 | 73.9 |
| Population group: | | | | | | | | |
| African | 6 | 2.7 | 9 | 4.0 | 19 | 8.5 | 190 | 84.8 |
| Coloured | 8 | 17.4 | 2 | 4.3 | 6 | 13.0 | 30 | 65.2 |
| Indian/Asian | 1 | 3.7 | 1 | 3.7 | 2 | 7.4 | 23 | 85.2 |
| White | 73 | 15.3 | 37 | 7.8 | 50 | 10.5 | 317 | 66.5 |
| Economic status: | | | | | | | | |
| Low income | 7 | 10.4 | 1 | 1.5 | 3 | 4.5 | 56 | 83.6 |
| Middle income | 66 | 11.3 | 38 | 6.5 | 62 | 10.7 | 416 | 71.5 |
| High income | 15 | 12.4 | 10 | 8.3 | 12 | 9.9 | 84 | 69.4 |
| Type of school: | | | | | | | | |
| Public | 67 | 12.4 | 27 | 5.0 | 51 | 9.4 | 395 | 73.1 |
| Private | 20 | 8.7 | 22 | 9.6 | 26 | 11.4 | 161 | 70.3 |
| Academic year: | | | | | | | | |
| First year | 24 | 6.9 | 21 | 6.0 | 34 | 9.7 | 271 | 77.4 |
| Second year | 27 | 12.3 | 12 | 5.5 | 20 | 9.1 | 160 | 73.1 |
| Third year | 37 | 18.0 | 16 | 7.8 | 23 | 11.2 | 129 | 62.9 |
| Tuition language: | | | | | | | | |
| Afrikaans | 31 | 13.5 | 14 | 6.1 | 25 | 10.9 | 159 | 69.4 |
| English | 57 | 10.5 | 35 | 6.4 | 52 | 9.6 | 400 | 73.5 |

Table 7: Cross-tabulation of cannabis use and background characteristics of respondents

| | Often | | Sometimes | | Seldom | | Never | |
|-------------------|-------|------|-----------|-----|--------|------|-------|------|
| | n | % | n | % | n | % | n | % |
| Gender: Male | 14 | 7.9 | 10 | 5.6 | 32 | 18.1 | 121 | 68.4 |
| Female | 15 | 2.5 | 25 | 4.2 | 84 | 14.2 | 466 | 79.0 |
| Population group: | | | | | | | | |
| African | 6 | 2.7 | 11 | 4.9 | 23 | 10.2 | 186 | 82.3 |
| Coloured | 5 | 10.9 | 4 | 8.7 | 8 | 17.4 | 29 | 63.0 |
| Indian/Asian | 2 | 7.4 | 2 | 7.4 | 0 | 0.0 | 23 | 85.2 |
| White | 16 | 3.4 | 18 | 3.8 | 86 | 18.2 | 352 | 74.6 |
| Economic status: | | | | | | | | |
| Low income | 3 | 4.5 | 2 | 3.0 | 7 | 10.6 | 54 | 81.8 |
| Middle income | 18 | 3.1 | 27 | 4.6 | 96 | 16.5 | 442 | 75.8 |
| High income | 7 | 5.9 | 6 | 5.1 | 14 | 11.9 | 91 | 77.1 |
| Type of school: | | | | | | | | |
| Public | 20 | 3.7 | 16 | 3.0 | 69 | 12.8 | 433 | 80.5 |
| Private | 7 | 3.1 | 19 | 8.3 | 48 | 21.1 | 154 | 67.5 |
| Academic year: | | | | | | | | |
| First year | 11 | 3.2 | 16 | 4.6 | 55 | 15.8 | 266 | 76.4 |
| Second year | 6 | 2.7 | 8 | 3.6 | 33 | 15.0 | 173 | 78.6 |
| Third year | 12 | 5.9 | 11 | 5.4 | 29 | 14.3 | 151 | 74.4 |
| Tuition language: | | | | | | | | |
| Afrikaans | 3 | 1.3 | 2 | 0.9 | 23 | 10.2 | 198 | 87.6 |
| English | 26 | 4.8 | 33 | 6.1 | 94 | 17.3 | 391 | 71.9 |

Table 8: Cross-tabulation of using hard drugs and background characteristics of respondents

| | Often | | Sometimes | | Seldom | | Never | |
|-------------------|-------|-----|-----------|-----|--------|-----|-------|------|
| | n | % | n | % | n | % | n | % |
| Gender: | | | | | | | | |
| Male | 1 | 0.6 | 2 | 1.1 | 2 | 1.1 | 172 | 97.2 |
| Female | 0 | 0.0 | 2 | 0.3 | 5 | 0.9 | 573 | 98.8 |
| Population group: | | | | | | | | |
| African | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 223 | 100 |
| Coloured | 0 | 0.0 | 1 | 2.2 | 1 | 2.2 | 43 | 95.6 |
| Indian/Asian | 0 | 0.0 | 0 | 0.0 | 1 | 3.7 | 26 | 96.3 |
| White | 1 | 0.2 | 3 | 0.6 | 5 | 1.1 | 457 | 98.1 |
| Economic status: | | | | | | | | |
| Low income | 1 | 1.5 | 0 | 0.0 | 1 | 1.5 | 65 | 97.0 |
| Middle income | 0 | 0.0 | 2 | 0.3 | 4 | 0.7 | 527 | 99.0 |
| High income | 0 | 0.0 | 2 | 1.8 | 2 | 1.8 | 108 | 96.4 |
| Type of school: | | | | | | | | |
| Public | 1 | 0.2 | 3 | 0.6 | 3 | 0.6 | 526 | 98.7 |
| Private | 0 | 0.0 | 1 | 0.4 | 3 | 1.3 | 219 | 98.2 |
| Academic year: | | | | | | | | |
| First year | 1 | 0.3 | 1 | 0.3 | 3 | 0.9 | 339 | 98.5 |
| Second year | 0 | 0.0 | 1 | 0.5 | 1 | 0.5 | 214 | 99.1 |
| Third year | 0 | 0.0 | 2 | 1.0 | 3 | 1.5 | 196 | 97.5 |
| Tuition language: | | | | | | | | |
| Afrikaans | 0 | 0.0 | 0 | 0.0 | 1 | 0.4 | 222 | 99.6 |
| English | 1 | 0.2 | 4 | 0.7 | 6 | 1.1 | 526 | 98.0 |

Table 9: Cross-tabulation of use of prescription medication and background characteristics of respondents

| | Often | | Sometimes | | Seldom | | Never | |
|-------------------|-------|------|-----------|------|--------|------|-------|------|
| | n | % | n | % | n | % | n | % |
| Gender: | | | | | | | | |
| Male | 16 | 10.2 | 27 | 15.3 | 65 | 36.9 | 66 | 37.5 |
| Female | 120 | 19.9 | 134 | 22.2 | 203 | 33.6 | 147 | 24.3 |
| Population group: | | | | | | | | |
| African | 23 | 10.0 | 61 | 26.5 | 69 | 30.0 | 77 | 33.5 |
| Coloured | 6 | 13.0 | 12 | 26.1 | 15 | 32.6 | 13 | 28.3 |
| Indian/Asian | 4 | 14.8 | 2 | 7.4 | 16 | 59.3 | 5 | 18.5 |
| White | 105 | 21.8 | 86 | 17.9 | 170 | 35.3 | 120 | 24.9 |
| Economic status: | | | | | | | | |
| Low income | 7 | 10.4 | 14 | 20.9 | 18 | 26.9 | 28 | 41.8 |
| Middle income | 106 | 17.8 | 126 | 21.1 | 206 | 34.6 | 158 | 26.5 |
| High income | 24 | 20.5 | 20 | 17.1 | 46 | 39.3 | 27 | 23.1 |
| Type of school: | | | | | | | | |
| Public | 100 | 18.3 | 111 | 20.3 | 185 | 33.8 | 151 | 27.6 |
| Private | 36 | 15.5 | 49 | 21.1 | 84 | 36.2 | 63 | 27.2 |
| Academic year: | | | | | | | | |
| First year | 59 | 16.7 | 78 | 22.1 | 128 | 36.3 | 88 | 24.9 |
| Second year | 44 | 19.9 | 35 | 15.8 | 84 | 38.0 | 58 | 26.2 |
| Third year | 35 | 16.7 | 48 | 22.9 | 58 | 27.6 | 69 | 32.9 |
| Tuition language: | | | | | | | | |
| Afrikaans | 55 | 24.1 | 37 | 16.2 | 76 | 33.3 | 60 | 26.3 |
| English | 83 | 15.1 | 123 | 22.2 | 194 | 35.0 | 155 | 27.9 |