Research

Depression, anxiety, stress and substance use in medical students in a 5-year curriculum

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Background. The mental health of medical students is a global concern, and medical training has been described by some as being detrimental to the health of medical students, affecting both their student experience and professional life.

Objectives. To determine the prevalence of depression, anxiety, stress and substance use among preclinical students in a 5-year outcomes-based medical curriculum. The study also investigated the association of selected demographic factors with these outcomes.

Methods. All University of the Free State medical students in semesters 3 (*n*=164) and 5 (*n*=131) during 2015 were included in this cross-sectional study. Depression, anxiety and stress levels were measured by means of the Depression Anxiety Stress Scales (DASS-21). Demographic questions were included in an anonymous self-administered questionnaire. Lifetime and past month substance use were determined.

Results. A prevalence of 26.5% for moderate to extremely severe depression, 26.5% for moderate to extremely severe anxiety, and 29.5% for moderate to extremely severe stress was recorded. Female students had significantly higher stress levels, but not increased anxiety. Relationship status and accommodation were not associated with these outcomes. Lifetime use of methylphenidate, lifetime use of alcohol, and past month use of alcohol were associated with depression.

Conclusion. The study revealed high levels of depression, anxiety and stress in 2nd- and 3rd-year medical students compared with the general population, but the levels were comparable to those of medical students elsewhere in the world. Past month substance use of alcohol and cannabis was lower than in international studies, but nicotine use was higher.

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Psychological distress is prominent in medical students, and it has been shown that members of this group are more prone to depression, anxiety and stress than comparable populations.[1] Yet, some studies found that these indicators of psychological distress are not unique to medical students.[2,3] Being a student, irrespective of whether a medical student, is stressful and associated with depression and anxiety. Ibrahim *et al.*[4] reviewed articles published on the prevalence of depression among university students in all disciplines, using a variety of measuring instruments, and found a range of 10 - 85%, with a weighted prevalence of 30.6%. Medical students, however, consistently obtain higher scores for depression, anxiety and stress than the general population.[1]

Dyrbye *et al.*[1] performed a systematic review of studies published between 1980 and 2005 reporting on depression, anxiety and other indicators of psychological distress among medical students. Two main schools of thought exist on the reason for medical students being so vulnerable. On the one hand, it is proposed that personality traits such as conscientiousness, that enhance academic performance and therefore a student's chances for selection, may also render them vulnerable to self-criticism in an environment of high academic or occupational demand. On the other hand, medical training itself has been described as a major psychological stressor. While the results on higher depression scores at entry into medical school are not consistent, there are numerous replications of the observation that medical students eventually have higher depression scores than comparable age-matched groups.[1] Yusoff *et al.*[5] even expressed concern that medical training causes mental health problems in medical students. Students themselves perceive curricular factors, such as examinations, high volume of work and time constraints, as the major factors contributing to high levels of stress in medical school.[5]

A prospective longitudinal study by Zoccolillo *et al.*[6] used the Diagnostic Interview Schedule (DIS) to screen for possible depression in 1st- and 2nd-year medical students, followed by an interview to confirm the diagnosis. They found an upward trend over time, and estimated a projected lifetime prevalence for depression in this cohort at three times that of their peers. The authors postulated that student selection seemed to contribute more to the findings than exposure to medical training.

A particular concern is the risk of substance use and abuse as a possible consequence of high levels of depression, anxiety and stress in this population group.[1] Baldwin *et al.*[7] completed a large alcohol and drug use survey at 23 medical schools in the USA, and reported past month use of alcohol of 87.5%, marijuana use of 10.0%, and nicotine use of 10.0%, with the corresponding figures for cocaine at 2.8% and tranquillisers at 2.3%, among the 2 046 participants.

The University of the Free State (UFS) is situated in the province with the third highest occurrence of alcohol use disorders in South Africa (SA), where alcohol abuse causes extensive harm to the population as a whole.[8] A recent study involving hostel-dwelling students on the campus of UFS showed a combined prevalence of hazardous, harmful and dependent drinking of 25.3%.[9]

The medical curriculum at the Faculty of Health Sciences, UFS, is unique in that it is the only 5-year (10 semester) medical curriculum in SA. Five semesters each are dedicated to preclinical and clinical training, respectively. The programme is outcomes based and accredited by the Health Professions Council of South Africa (HPCSA), which has recently commended the programme for its innovative integrated assessments, quality of teaching material, and resources to facilitate self-directed learning.[10]

At the time of the study, students were selected for medical training at the institution primarily on academic merit, yet geographical origin and leadership qualities were also taken into account. All lectures are presented in Afrikaans and English. Academic support is provided according to the initiative of the module leader or session presenters, and may take the form of continuous assessment, revision sessions or individual counselling. Some modules make use of tutorials presented by student tutors. The Faculty of Health Sciences also hosts a formal academic development plan that identifies and supports students who lag academically.[10]

A perception of common occurrence of psychiatric diagnoses among local medical students gave rise to the question to what extent students in this 5-year curriculum experience depression, anxiety and stress; and whether these are associated with substance use. The aim of the study was to assess the prevalence of depression, anxiety, stress and substance use among preclinical medical students. Associations between these outcomes and selected demographic factors were also investigated.

Methods

A group of 2nd-year students compiled the research proposal and questionnaire under the guidance of the supervisor and the Department of Biostatistics. The protocol was approved by the Ethics Committee of the Faculty of Health Sciences, UFS (ref. no. UFS-HSD 2014/0156). Permission was obtained from the relevant UFS authorities: the Head of the School of Medicine, the Dean of the Faculty of Health Sciences, the Vice-Rector: Research, and the Dean: Student Affairs.

A quantitative cross-sectional study design was used, with convenience sampling. The inclusion criteria were medical students in semester 3 (n=164) and semester 5 (n=131), who were registered at the School of Medicine of the Faculty of Health Sciences, UFS, during the first half of 2015. These two groups were selected for inclusion in the study, as semester 3 students had not been exposed to clinical environments yet, whereas semester 5 students had been exposed. The date of the investigation was selected so that no major tests or examinations were scheduled to take place in that particular week.

The questionnaire consisted of demographic questions, questions to determine depression, anxiety and stress levels according to the Depression Anxiety Stress Scales (DASS-21),[11] and questions on alcohol and drug use.

DASS-21 distinguishes between depression, anxiety and stress as distinct manifestations of psychological distress, and assigns a value on a scale ranging from normal to severely affected. Depression is defined as a range of scores on DASS that indicates the presence of self-blame, pessimism and loss of enjoyment. Anxiety is defined as a range of scores that indicates a state of persistent apprehension and worry, accompanied by physical symptoms of

sympathetic activation. Stress is defined as a range of scores that indicates a state of over-arousal, tenseness and the inability to relax. The scales are purely for screening purposes and do not provide a definitive diagnosis. As described in the DASS guidelines, the categories moderate, severe and extremely severe are applied to indicate the degree of each of the respective conditions.[11]

For purposes of this study, substance use is defined as medicinal or recreational use of selected psychoactive substances, as selected by the researchers. Substance use was determined for the periods lifetime (ever), past month and past week. Some questions of the Drug Abuse Screening Test (DAST)[12] were also included, which are not reported here.

The questionnaire was tested in a pilot study that included six physiotherapy students, equally representing the two language groups, to test the clarity of questions and practical aspects, such as the time to complete. Translation errors were corrected. Formal translation-back translation methods were not utilised, but it must be noted that the majority of the research team were fluent in both English and Afrikaans.

The research was introduced by the student researchers to each class directly following a normally scheduled compulsory contact session. The voluntariness and anonymity of participation were explained before the questionnaires were handed out to all students present, excluding the researchers themselves. The anonymous self-administered questionnaire was available in Afrikaans or English and was accompanied by an information document. Non-respondents were students absent on the day of questionnaire distribution, and students who did not wish to complete the questionnaire. The students performing the research formed part of the study population, but were excluded from participation. To maintain anonymity, participants were requested to place the completed questionnaires in a box.

Results are reported by frequencies and percentages. Subgroups were compared using χ^2 or Fisher's exact tests, as appropriate. A p-value <0.05 was considered statistically significant, and 95% confidence intervals (CIs) were calculated for differences between percentages. All analyses were performed using SAS version 9.2 (SAS Institute, USA).

Results

A total number of 295 students were registered in 2015 for semesters 3 and 5. A total of 257 questionnaires were returned, of which 14 were excluded owing to a number of incomplete items on the DASS-21 section. Another two questionnaires that contained inconsistent and erratic responses were excluded from the analysis. Therefore, 241 questionnaires could be analysed. The response rate was 81.7% (137/164 (83.5%) for semester 3, and 104/131 (79.4%) for semester 5). Semester 3 participants were mainly in the age group 18 - 20 years (75.9%) and semester 5 participants mainly in the age group 21 - 23 years (51.9%). Female students were in the majority in both semesters: 52.6% of semester 3 students and 56.7% of semester 5 students.

The most common depression category, apart from normal/mild, in both semesters was moderate (Table 1), whereas for anxiety it was extremely severe in both semesters. For stress the most common categories, apart from normal/mild, were moderate for semester 3 and severe for semester 5. In both semesters seven students each reached severe or extremely severe for all three conditions.

Table 2 shows a comparison between students of semesters 3 and 5. There was a statistically significant higher percentage of anxiety (p=0.01, 95% CI 3.8 - 25.5) and stress (p=0.03, 95% CI 1.6 - 24.2) in semester 3 students. Significantly more semester 5 students had none of the three conditions (p=0.05, 95% CI 0.4

- 25.3). The most common combination of conditions in each semester, other than all three or none, was anxiety and stress in 10.3% of semester 3 students, and depression only in 9.7% of semester 5 students.

An upward trend was seen for the diagnosis of depression and anxiety and current use of antidepressants progressing from semesters 3 to 5, yet the differences are not statistically significant (Table 3).

Female students were statistically significantly more likely to report stress (Table 4, $p<0.01$, 95% CI for difference between female students and male students: 6.3 - 28.6), yet only marginally more likely to report anxiety or depression (p=0.32 and p=0.52, respectively). No significant associations were found between relationship status or housing arrangement and any of the conditions.

The highest prevalence of past month substance use was found for alcohol (71.0%, Table 5), followed by nicotine (19.1%) and codeine (9.5%). Lifetime use of marijuana was relatively high at 22.8%, but past month use dropped to 5.4%. There were low numbers of lifetime use of cocaine, methcathinone (CAT), methylenedioxy-N-methylamphetamine (MDMA) (Ecstasy) and lysergic acid diethylamide (LSD), with no past month use of these substances reported. No lifetime use or past month use of crystal methamphetamine (tik) or heroin was reported.

Table 6 shows a statistically significant association between lifetime methylphenidate use and depression when comparing lifetime users and never users ($p<0.01$, 95% CI 10.7 - 41.8). Likewise, a statistically significant association between lifetime methylphenidate use and stress was found when the same groups were compared ($p<0.01$, 95% CI 7.0 - 38.4). Past month use of methylphenidate was substantially less than lifetime use and no association was demonstrated with depression (p=0.11), anxiety (p=0.34) or stress (p=0.53), possibly owing to small numbers.

Depression was significantly more common in lifetime alcohol users compared with never users (p=0.01, 95% CI 9.3 - 32.0), and past month alcohol users compared with non-users (p=0.01, 95% CI 5.4 - 27.2). Anxiety was statistically significantly more common in past month users of alcohol compared with non-users (p=0.04, 95% CI 1.7 - 24.6).

Depression was also statistically significantly more likely in past month nicotine users compared with non-users (p=0.03, 95% CI 0.2 - 30.9).

There were no significant associations between codeine or marijuana use and depression, anxiety or stress.

Table 1. Degree of depression, anxiety and stress (n=241)

Degree of psychological distress	Normal, n (%)	Mild, n (%)	Moderate, n (%)	Severe, n (%)	Extremely severe, n (%)
Depression					
Total	144 (59.8)	33 (13.7)	32 (13.3)	16 (6.6)	16 (6.6)
Semester 3	78 (56.9)	22 (16.1)	19 (13.9)	11 (8.0)	7 (5.1)
Semester 5	66 (63.4)	11 (10.6)	13 (12.5)	5 (4.8)	9 (8.7)
Anxiety*					
Total	130 (53.9)	45 (18.7)	21 (8.7)	15 (6.2)	28 (11.6)
Semester 3	70 (51.5)	21 (15.4)	16 (11.8)	10 (7.4)	19 (14.0)
Semester 5	60 (58.3)	24 (23.3)	5 (4.9)	5 (4.9)	9 (8.7)
Stress					
Total	142 (58.9)	28 (11.6)	32 (13.3)	28 (11.6)	11 (4.6)
Semester 3	72 (52.6)	17 (12.4)	23 (16.8)	18 (13.1)	7 (5.1)
Semester 5	70 (67.3)	11 (10.6)	9 (8.7)	10 (9.6)	4 (3.9)

*Semester 3: n=136; semester 5: n=103; total: N=239.

Table 2. Positive screening for depression, anxiety and stress

Screening	Semester 3, n (%) (n=137)	Semester 5, n (%) (n=104)	p-value	Total, N (%) (N=241)
Depression (DASS-21 >6)	37 (27.0)	27 (26.0)	0.86	64 (26.6)
Anxiety (DASS-21 >5)*	45 (33.1)	19 (18.5)	0.01	64 (26.6)
Stress (DASS-21 >9)	48 (35.0)	23 (22.1)	0.03	71 (29.5)
Depression, anxiety and stress*	19 (14.0)	14 (13.6)	0.93	33 (13.8)
None of the abovementioned three*	71 (52.2)	67 (65.1)	0.05	138 (57.7)

*Semester 3: n=136; semester 5: n=103; total: N=239, as two participants did not complete the anxiety items fully.

Table 3. Previous diagnosis and current medication for depression and anxiety

Diagnosis and medication	Semester 3, n (%) (n=137)	Semester 5, n (%) (n=104)	p-value	Total, N (%) (N=241)
Previously diagnosed with depression	16 (11.7)	15 (14.4)	0.53	31 (12.9)
Previously diagnosed with anxiety	14 (10.2)	14 (13.5)	0.44	28 (11.6)
Current medication for depression	8 (5.8)	8 (7.8)	0.55	16 (6.6)
Current medication for anxiety	11 (8.0)	8 (7.7)	0.92	19 (7.9)

Discussion

The current study is limited by its cross-sectional design and because a wide range of measuring instruments are used in reported studies. However, it provides a useful baseline for further investigations, e.g. the effect of major transitions in terms of implementation of the English-only language policy and demographic changes in selection criteria in the immediate future.

The study showed a prevalence of 26.6% for depression, 26.6% for anxiety and 29.5% for stress, as defined by the DASS-21 screening tool, in the preclinical medical student cohort at UFS for 2015. It is important to note that 12.9% of the study cohort had a lifetime diagnosis of depression and 11.6% a lifetime diagnosis of an anxiety disorder.

These findings should be interpreted against the background of the high levels of anxiety and depression in the general population of the Free State and findings among similar study populations done on similar populations using the same measuring instrument. The SA Stress and Health (SASH) study[8] reported a prevalence of lifetime diagnosis of mood disorders of 9.8% and anxiety of 15.8% for the Free State population

using the Composite International Diagnostic Interview (CIDI) as measuring instrument. Both these figures were statistically significantly higher than the corresponding figures for the country as a whole. Owing to the difference in the measuring instruments and definition of outcomes measured, the current study results cannot be directly related to these figures, yet the results seem high if one considers the relatively young age of the study population.

With regard to comparability, findings of the studies mentioned below, which also used DASS-21 or DASS-42 and categorised the results in a similar manner, are of value.

A study of 575 medical students at the Alfaisal University in Riyadh, Saudi Arabia,[13] using DASS-21, showed a fluctuation of depression, anxiety and stress scores before and after examinations: between 43% and 30% for moderate or more severe depression, between 63% and 47% for moderate or more severe anxiety, and between 41% and 30% for moderate or more severe stress. The results of the current study therefore correspond with their post-examination measurements, with a notable lower level of moderate to extremely severe anxiety.

Another study using DASS-21 in a group of 508 undergraduate college students at a university in the USA[14] reported a prevalence of 29% for depression, 27% for anxiety and 24% for stress. These results are closely comparable with the results of the current study. However, the authors did not explicitly indicate whether they grouped normal and mild categories together. It is therefore possible that the figures for positive cases appear higher than their actual value because they included mild cases, whereas in the current study mild cases were grouped together with the normal category. The instructions for DASS-21 indicate that the mild category refers to a group of individuals who experience symptoms that are not yet so severe as to prompt the person to seek treatment.

A similar study was done in a population of 1 617 Turkish undergraduate students using DASS-42, which is an extended version of DASS-21.[15] The authors found a prevalence of 27% for moderate or more severe depression, 47% for moderate or more severe anxiety, and 27% for moderate or more severe stress. Medical students did not attain higher scores in this particular group.

The current study shows scores of stress and depression comparable to those found in studies on general student populations, performed with the same or similar test instruments, but the levels of anxiety measured tended to be lower.

Demographic factors	Depression (DASS-21 >6)	Anxiety (DASS-21 >5)	Stress (DASS-21 >9)
Sex			
Female, *n* (%) (*n*=131)	37 (28.2)	38 (29.0)	49 (37.4)
Male, *n* (%) (*n*=110)	27 (24.6)	26 (24.1)	22 (20.0)
p-value	0.52	0.39	<0.01
Relationship status*			
Single, *n* (%) (*n*=148)	40 (27.0)	37 (25.0)	42 (28.4)
Married or in a relationship, *n* (%) (*n*=92)	23 (25.0)	26 (28.9)	28 (30.4)
p-value	0.73	0.51	0.73
Housing arrangement			
With family, *n* (%) (*n*=40)	13 (32.5)	12 (30.0)	14 (35.0)
Hostel on campus, *n* (%) (*n*=66)	15 (22.7)	16 (24.2)	18 (27.3)
Private accommodation, *n* (%) (*n*=135)	36 (26.7)	36 (27.1)	39 (28.9)
p-value	0.54	0.81	0.68

*Missing data: 1.

This trend coincides with a lower than expected level of anxiety in female students. According to the literature, female students are more likely to report anxiety and stress.[1,4,12-14] In the current study, female students showed a significantly higher tendency for stress (*p*<0.01) than male students, yet there were no significant differences with regard to depression or anxiety.

In line with the reported literature,[1] semester 3 students showed statistically significant higher levels of anxiety and stress than semester 5 students. Nonetheless, the prevalence of depression did not differ significantly between the two year groups.

Past month alcohol use in the study population (71.0%) compares favourably with that among US medical students, which ranges from 79% to 84%[16] and the 87% of alcohol use during the past two months reported among 1st-year psychology students from the University of Limpopo.[17] The SA Youth Risk Survey of 2011 reported past month alcohol use of 32.3% among high school learners in SA and 46.2% for the Free State.[18]

The current study found past month cigarette smoking of 19.1% among the study population, while US studies showed figures of 10 - 12% for daily or regular use of nicotine.[16] The corresponding figures for SA schoolchildren were 17.6% for the country and 24.9% for the Free State.[18]

While cigarette smoking was more common among the current study population compared with similar US populations, past month use of cannabis was found to be 5.4% compared with the corresponding figures for US studies ranging between 1% and 28%.[16] Past month use for school

learners in SA was 9.2% and 12.4% for the Free State.[18] The finding of 22.8% for lifetime use of cannabis was low compared with studies reporting lifetime use of cannabis among US medical students from 1973 to 2013, reporting figures between 47% and 74%.[16] The figure for lifetime use of cannabis among high school children in SA was 12.8% and for the Free State 13.5%.[18]

Cannabis was the only illicit drug used during the 30 days preceding the current study. Low figures were recorded for lifetime exposure to other illicit drugs: cocaine (1.7%), CAT (1.2%), Ecstasy (3.3%) and LSD (1.2%). Lifetime use for cocaine in the US review ranged from 20% to 39%, and for stimulants between 20% and 27%.[16] There is no literature available on the use of illicit drugs among university students or medical students in SA. The SA Youth Risk Survey of 2011[18] reported the lifetime use of cocaine among high school learners as 4.9% nationally and 7.2% for the Free State.

A recent survey by Jain *et al*.[19] showed that 11% of undergraduate medical students at UFS use methylphenidate. The lower figure of 5.3% found for past month use of methylphenidate in a proportion of the same population in the current study could reflect the timing of the investigation in relation to major assessments. No national figures are available for comparison in this regard. In a recent comprehensive meta-analysis of studies on methylphenidate use in medical students, Finger *et al*.[20] reported lifetime use of 8.3 - 9% and past year use of 3 - 16%. Most of these students used methylphenidate intermittently for performance enhancement.

Table 5. Substance use

Substance	Semester 3, n (%) (n=137)	Semester 5, n (%) (n=104)	p-value	Total, N (%) (N=241)
Methylphenidate				
Lifetime use	26 (18.9)	20 (19.2)	0.96	46 (19.1)
Past month use	9 (6.6)	4 (3.9)	0.35	13 (5.3)
Alcohol				
Lifetime use	116 (84.7)	91 (87.5)	0.53	207 (85.9)
Past month use	98 (72.6)	73 (70.2)	0.68	171 (71.0)
Nicotine				
Lifetime use	33 (24.1)	33 (31.7)	0.19	66 (27.4)
Past month use	22 (16.1)	24 (23.1)	0.17	46 (19.1)
Marijuana				
Lifetime use	30 (21.9)	25 (24.0)	0.69	55 (22.8)
Past month use	9 (6.6)	4 (3.9)	0.35	13 (5.4)
Codeine				
Lifetime use	9 (6.6)	33 (31.7)	<0.0001	42 (17.4)
Past month use	7 (5.1)	16 (15.4)	0.01	23 (9.5)
Benzodiazepine				
Lifetime use	5 (3.7)	11 (10.6)	0.03	16 (6.6)
Past month use	3 (2.2)	1 (1.0)	0.64	4 (1.7)
Cocaine				
Lifetime use	3 (2.2)	1 (1.0)	0.64	4 (1.7)
Past month use	0 (0)	0 (0)	-	0 (0)
CAT				
Lifetime use	0 (0)	3 (2.9)	0.08	3 (1.2)
Past month use	0 (0)	0 (0)	-	0 (0)
MDMA (Ecstasy)				
Lifetime use	3 (2.2)	5 (4.8)	0.30	8 (3.3)
Past month use	0 (0)	0 (0)	-	0 (0)
LSD				
Lifetime use	1 (0.7)	2 (1.9)	0.58	3 (1.2)
Past month use	0 (0)	0 (0)	-	0 (0)

The current study also showed past month use of codeine of 9.5% and benzodiazepines of 1.7%. Interestingly, semester 5 students had a statistically significant higher lifetime use of benzodiazepines (p=0.03), lifetime use of codeine (p<0.0001), and past month use of codeine (p=0.01).

The study found an association between lifetime use of methylphenidate and depression, lifetime use of nicotine and depression, and lifetime use of alcohol and depression. These results need to be explored in further studies.

Medical students at UFS suffer near identical levels of depression and stress, and similar or lower levels of anxiety than their peers in institutions where comparable measuring instruments were used. The shorter 5-year medical curriculum at UFS, therefore, does not seem to contribute to these conditions, yet shows a positive association with lower levels of anxiety, especially in female students. Several curriculum-specific factors may be responsible for this tendency, e.g. that expectations are well described in the outcomes-based model and the emphasis given to academic and psychological support in the curriculum.

The authors recommend that aspiring medical students should be made aware of the potential risk to their mental health posed by their career choice. Likewise, academic institutions should take cognisance of the tendency of medical students to fall prey to psychological distress under academic pressure. The medical curriculum should also contain instruction on resilient behaviour and healthy responses to stress during the introductory phase. The associations between alcohol use and depression and anxiety, and nicotine use and depression, need to be incorporated in such instruction.

Conclusion

Medical curricula in general are challenging in terms of volume and complexity, which create an environment where stress vulnerability and resilience are tested. The current study supports a widely reported phenomenon of higher levels of depression, anxiety and stress in medical students compared with the surrounding population.

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Table 6. Association between substance use and depression, anxiety and stress

Substance	Substance use	Depression, n (%)	Anxiety, n (%)	Stress, n (%)
Methylphenidate				
Lifetime	Yes (n=46)	22 (47.8)	17 (37.0)	22 (47.8)
	No (n=195)	42 (21.5)	47 (24.4)	49 (25.1)
p-value		<0.01	0.08	<0.01
Past month	Yes (n=13)	6 (46.2)	5 (38.5)	5 (38.5)
	No (n=227)	57 (25.1)	59 (26.2)	65 (28.6)
p-value		0.11	0.34	0.53
Alcohol				
Lifetime	Yes (n=207)	61 (29.5)	58 (28.3)	65 (31.4)
	No (n=34)	3 (8.8)	6 (17.7)	6 (17.7)
p-value		0.01	0.19	0.10
Past month	Yes (n=171)	53 (31.0)	52 (30.8)	54 (31.6)
	No (n=68)	10 (14.7)	12 (17.7)	16 (23.5)
p-value		0.01	0.04	0.22
Nicotine				
Lifetime	Yes (n=66)	23 (34.9)	21 (32.3)	22 (33.3)
	No (n=175)	41 (23.4)	43 (24.7)	49 (28.0)
p-value		0.07	0.24	0.42
Past month	Yes (n=46)	18 (39.1)	15 (33.3)	16 (34.8)
	No (n=195)	46 (23.6)	49 (25.3)	55 (28.2)
p-value		0.03	0.27	0.38
Marijuana				
Lifetime	Yes (n=55)	14 (25.5)	15 (27.3)	17 (30.9)
	No (n=186)	50 (26.9)	49 (26.6)	54 (29.0)
p-value		0.83	0.92	0.79
Past month	Yes (n=13)	1 (7.7)	2 (15.4)	3 (23.1)
	No (n=228)	63 (27.6)	62 (27.4)	68 (29.8)
p-value		0.19	0.52	0.76
Codeine				
Lifetime	Yes (n=42)	14 (33.3)	11 (26.2)	13 (31.0)
	No (n=199)	59 (25.1)	53 (26.9)	58 (29.2)
p-value		0.27	0.92	0.82
Past month	Yes (n=23)	6 (26.1)	6 (26.1)	7 (30.4)
	No (n=218)	58 (26.6)	58 (26.9)	64 (29.4)
p-value		0.96	0.94	0.91