

Substance Use among University Students at the St Augustine Campus of The University of the West Indies

AM Dhanookdhary, AM Gomez, R Khan, A Lall, D Murray, D Prabhu, A Ragoonath, N Singh, S Tewari, FF Youssef

ABSTRACT

Objective: Substance use and abuse is a well known public health risk that peaks in persons between 18 and 25 years of age and is prevalent among university students. While this has been repeatedly documented in developed nations, there have been limited studies in the English-speaking Caribbean. This study therefore sought to assess the prevalence of alcohol, tobacco and marijuana use among university students in the English-speaking Caribbean and any associated risk factors.

Methods: The study was designed as a descriptive, cross-sectional study to assess substance use in full-time, undergraduate students of The University of the West Indies (UWI), Trinidad and Tobago, over a six-month period. Questionnaires were distributed and students asked to self-report on their use of alcohol, tobacco and marijuana during the preceding six months.

Results: The six-month prevalence rate for alcohol was 70% and 28% of students were identified as regular users. Binge drinking was estimated at 31%. Muslims were least likely to have used alcohol when compared to other religious groupings. The prevalence rate for tobacco and marijuana was 17% and 13%, respectively. Ten per cent used all three substances. The use of all three substances was associated with multiple problems.

Conclusion: We conclude that substance use is common among many students of the UWI but generally lower than reports from other regions of the world. Despite this, substance use is associated with a number of problems and immediate educational interventions may be necessary to assist students in making informed and responsible choices.

Keywords: Alcohol, cigarette smoking, marijuana, religious differences, university students

Uso de Sustancias Entre los Estudiantes Universitarios en el Campus de Saint Augustine de la Universidad de West Indies

AM Dhanookdhary, AM Gomez, R Khan, A Lall, D Murray, D Prabhu, A Ragoonath, N Singh, S Tewari, FF Youssef

RESUMEN

Objetivo: El uso y abuso de sustancias es un riesgo bien conocido de la salud pública, que alcanza sus niveles más altos en personas entre los 18 y 25 años de edad, y es prevalente entre estudiantes universitarios. Si bien este fenómeno ha sido documentado una y otra vez en países desarrollados, los estudios en el Caribe anglófono han sido limitados. Por lo tanto, este estudio se propuso evaluar la prevalencia del uso del alcohol, el tabaco, y la marihuana, entre los estudiantes universitarios del Caribe angloparlante, y cualquier factor de riesgo asociado.

Métodos: El estudio se diseñó como un estudio descriptivo transversal para evaluar el uso de sustancias en estudiantes de pregrado a tiempo completo en la Universidad de West Indies (UWI), Trinidad y Tobago, por un periodo de seis meses. Se distribuyeron encuestas y se les pidió a los estudiantes entregar auto-reportes sobre el uso que habían hecho del alcohol, el tabaco y la marihuana en los seis meses precedentes.

Resultados: La tasa de prevalencia de seis meses para el alcohol fue del 70% y 28% de los estudiantes fueron identificados como usuarios regulares. El consumo de alcohol en forma de borracheras deliberadas se estimó en un 31%. Los musulmanes fueron los menos propensos al consumo de alcohol,

en comparación con los restantes grupos religiosos. La tasa de prevalencia para el tabaco y la marihuana fue de 17% y 13% respectivamente. El diez por ciento hacía uso de las tres sustancias. El uso de las tres sustancias estaba asociado a múltiples problemas.

Conclusión: *Concluimos que el uso de sustancias es común entre muchos estudiantes de UWI, pero de modo general se halla por debajo de lo que se reporta desde otras regiones del mundo. No obstante, el uso de sustancias se encuentra asociado con un número de problemas, y puede que se requieran intervenciones educacionales inmediatas para ayudar a los estudiantes, de modo que estos puedan tomar decisiones responsables e informadas.*

Palabras claves: Alcohol, consumo de cigarrillos, marihuana, diferencias religiosas, estudiantes universitarios

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INTRODUCTION

Substance use and abuse is a major public health problem worldwide. In most societies, the principal substances used are alcohol, tobacco and marijuana. Alcohol use is the leading cause of injury and death among university students and young adults in the United States of America [USA] (1, 2) while tobacco use is a major determinant of premature morbidity and mortality (3, 4). Marijuana is well established as a gateway drug (5, 6).

A review of the literature across countries suggests that substance use tends to peak between the ages of 18 and 25 years of age (7, 8) with university students being at particular risk for alcohol abuse when compared to non-enrolled age-matched controls (9, 10); the overall trend of alcohol use is one that increases from high school into university before dropping off after graduation (11). The reverse is true for tobacco, though prevalence rates among university students are still high (12).

In the USA, prevalence rates for tobacco use vary but generally lie between 30 and 40%; however, unlike alcohol rates, they showed an increase throughout the 1990s (13–15). A wide ranging international study across 23 nations yielded similar findings (16). In the USA, marijuana prevalence rates for the past 30 days were between 13–17% and had also shown increases between 1993 and 2001 (17) with similar results being reported in an earlier study (18).

Outside of the developed world, less work has been done to quantify substance use among the general public and in particular university students. A review of the literature concerning alcohol concludes, “The prevalence of hazardous drinking in Australasia, Europe and South America appears similar to that in North America, but is lower in Africa and Asia”; despite the lower rates in Asia and Africa, alcohol use is still a significant health problem being associated with risky sexual behaviour and poor academic performance (7).

In the Caribbean, even less work has been done to assess the prevalence of substance use among university students or the general public and its concomitant public health risk. A recent review across a 25-year period found only nine full-text peer reviewed papers addressing the issue in the region (19) and most of this work was carried out in the

1980s and early 1990s (19). In Jamaican high school students, just over 50% have used alcohol, 17% tobacco (20) and 10% marijuana (21) while in Trinidad and Tobago, one study indicates prevalence rates of 84%, 35% and 8% for alcohol, tobacco and marijuana respectively (22).

Trinidad and Tobago (TT) [<https://www.cia.gov/library/publications/the-world-factbook/geos/td.html>] is a twin island nation, the most southern of the Caribbean, lying approximately 8 nautical miles off the coast of Venezuela. Its population is heterogeneous, with two ethnicities dominating (40% African and 40% Indian), and another 20% comprising persons of mixed ethnicity and those of Caucasian, Chinese and middle East origin. This background has created a melting pot of ethnicities, religions and cultural traditions as evidenced by the fourteen annual public holidays, the majority of which recognize various religious and cultural events.

The Trinidad and Tobago economy is largely dependent upon revenues earned from the exportation of oil and natural gas. The increase in the price of oil during the 1970s fuelled fairly steady economic growth over the last quarter of a century and the standard of living is relatively high compared to other small island states (GDP = 24 700 million US). Of particular note, has been a dramatic increase in the number of university students over the past 10 years. The only university in existence prior to 2005 has seen a three-fold increase in student enrolment. The government also opened another university in 2005 and a number of private educational institutes have been established that offer degree programmes in conjunction with North American and British universities. The legal drinking and smoking age in Trinidad and Tobago is eighteen (18) years but little data is available on national rates of substance use and abuse.

Given the public health risks associated with substance use among university students and the limited data collected in the Caribbean region, we sought to assess the six-month prevalence rate of substance use among students at the St Augustine Campus of The University of the West Indies (UWI), Trinidad and Tobago. We also sought to make use of the unique demographic composition of Trinidad and Tobago to assess any risk factors associated with alcohol use. It has

been reported that Indo-Trinidadians were more inclined to frequent alcohol use though Afro-Trinidadians were more inclined to use marijuana (22). In the USA, Caucasian students are more likely to drink heavily compared to African-American and Hispanic students (23). Being male, coming from a wealthier family and living away from home are all significant risk factors associated with alcohol use (24). While the general consensus is that men are more inclined to substance use when compared to women, of concern is the fact that the gender gap is narrowing (25). Other reports emanating from the Caribbean suggest that religion and strength of religious convictions may also influence substance use among adolescents (26, 27) and this has been supported by studies in other parts of the world (28–30).

SUBJECTS AND METHODS

This study was approved by the Ethics Committee of the Faculty of Medical Sciences, The University of the West Indies, St Augustine. It was designed as a descriptive cross-sectional study to assess substance use in fulltime, undergraduate students of the UWI, St Augustine Campus, Trinidad and Tobago over a six-month period. Data were collected over a two-month period between May and June 2007. The Study used stratified random sampling (faculty and gender) due to the difference in enrolment between faculties and the larger number of women enrolled at UWI, as well as convenience sampling.

The full-time undergraduate population at the UWI Campus, St Augustine was 8910 students in the academic year 2006/2007. An estimate of prevalence was based on a survey done on secondary school students entitled, 'National Secondary Schools Survey 2002–Trinidad and Tobago' where 86.5% of students between the ages 17–18 years used alcohol. Using a confidence interval of 95% and a margin of error of 5%, a minimum sample size of 280 persons was determined.

A questionnaire was developed based upon questions utilized in previous published reports (22, 24, 31). Respondents were required to provide information about their age, gender, ethnicity, religion, residence, family income and parents' education on the questionnaire but not their names. In the second section, they were asked about their six-month history of use as it pertained to alcohol, tobacco and marijuana.

With respect to alcohol, tobacco and marijuana, the participants were asked to (i) estimate their usage over the past six-months, (ii) estimate their usage over the past 30 days, (iii) types of substance consumed, (iv) average amount consumed per episode (v) maximum number of drinks consumed in a two-hour period, (vi) reasons for use, (vii) side effects experienced when using the substance, (viii) parents' knowledge of use and (ix) change in consumption patterns upon entering university. Students were required to choose an answer from an appropriate list provided. A pilot study involving approximately 20 students demonstrated the

suitability of the questionnaire and indicated that it took approximately twenty minutes to complete.

Participants provided informed consent before participating in the study and then were provided with a questionnaire which they were asked to complete on site. Participants were required to show a valid university identification card to ensure that they were actually full-time, undergraduate students.

Statistical analysis

Data were analysed using the SPSS Version 12.0. Variables containing socio-demographic data were compared with those containing usage data and analysed using the chi-square test. The α -error was set at $p < 0.05$.

RESULTS

A total of 540 questionnaires were distributed and 509 questionnaires were returned (94% response rate). The sample included a greater proportion of women, 270 (53%) than men, 239 (47%) which is consistent with the overall enrolment profile. The ages ranged from 17 to 50 years, with a median of 20 years and a mean (\pm standard deviation) of 21.3 (\pm 3.1) years. Table 1 highlights key demographic data of those sampled.

Alcohol

The six-month prevalence rate (95% CI) of those who used alcohol at least once, was 70% (66, 74) [Fig. 1] and the 30-day prevalence rate was 64% (60, 68). Students were also asked to indicate the frequency with which they consumed alcohol; 28% of persons were classified as regular users (consumption several times for the month or more often). Four per cent (4%) of persons indicated they consumed alcohol on a daily basis.

In order to assess dangerous levels of intoxication, students were asked to report on the number of times they had experienced drunkenness and the maximum number of drinks consumed within a two-hour period. Twenty-two per cent reported being drunk at least once during the past 30 days and 7% indicated that they were drunk on more than three occasions. Binge drinking can be defined as the consumption of five or more drinks within a two-hour period among men or four or more drinks within a similar period among women (24, 32). Using this definition, 31% (27, 35) of students identified that they had participated in binge drinking on at least one occasion (Fig. 1).

Alcohol use was more common among men with almost 80% (75, 85) of men reporting having used alcohol in the past six-months and only 62% (56, 68) of women having used alcohol ($p < 0.001$). This difference was even more pronounced when regular users of alcohol were considered; 13% of women sampled were regular users *versus* 44% of men ($p < 0.001$); no women consumed alcohol on a daily basis. No associations were noted for alcohol use or regular use with respect to ethnicity but Muslims were found to be

Table 1: Demographic Composition of Students Surveyed

| Gender | Age | | Ethnicity | | Religion | | Monthly Family Income (\$US) | | |
|--------|----------|-------|-----------|---------|----------|-----------|------------------------------|---------------|----------|
| Male | 239 (47) | 17-19 | 118 (23) | African | 66 (13) | Muslim | 55 (11) | < 250 | 12 (2) |
| Female | 270 (53) | 20-25 | 345 (68) | Indian | 321 (63) | Hindu | 160 (31) | \$250 – 800 | 68 (13) |
| | | >25 | 45 (9) | Mixed | 109 (21) | Christian | 260 (51) | \$800 – 1600 | 154 (30) |
| | | | | Other | 8 (2) | Other | 27 (6) | \$1600 – 2400 | 92 (18) |
| | | | | | | | | > \$2400 | 115 (23) |

Table showing demographic composition of the 509 students sampled (percentage of sample is included in parenthesis).

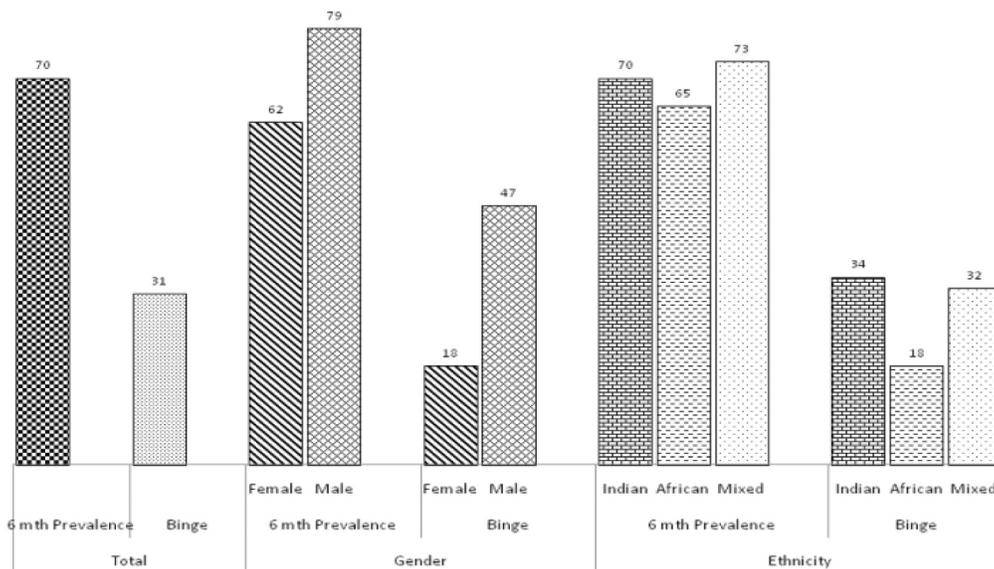


Fig. 1: Prevalence rates for six-month alcohol use and binge drinking

The graph depicts the prevalence rates for six-month alcohol use and binge drinking. It provides data on total use, breakdown by gender and ethnicity. Both six-month prevalence rates and binge drinking are more common among males but there is no difference between ethnicities. Figures above the bars indicate percentages. For total prevalence these represent the percentage of the total sample. For gender and ethnicity these represent percentage of that particular demographic sampled.

less likely to use alcohol when compared to other religious groupings (Table 2).

In order to assess the effect of socio-economic factors upon the consumption of alcohol, participants were asked to indicate their average family income and the educational level of their parents (Table 2). There were no associations noted except that six-month prevalence rates were less among persons whose father had a primary school education or lower ($\chi^2 = 7.62, df = 2, p = 0.22$). This relationship was not significant among regular users of alcohol.

Among regular users of alcohol, 66% of students indicated that their consumption of alcohol had increased since their enrolment in university *versus* 7% who noted a decrease and 26% who described no change. Thirty-one per cent of students indicated that their parents were unaware of

their consumption of alcohol or did not approve of it (data analysis for this question was restricted to persons below the age of 25 years).

Students were also asked to indicate any problems they associated with alcohol use. The most common problems reported were missing classes, cravings and interpersonal issues as a result of their alcohol use. Twenty-seven per cent (27%; 95% CI, 19, 36) of students who had used alcohol in the past six-months indicated that they experienced three or more problems. These data are summarized in Table 3.

Tobacco

The prevalence rate of tobacco use during the past six-months was 17% (9, 25) with 88 persons indicating they had used tobacco on at least one occasion. Regular use of

Table 2: Relationship between six-month prevalence rates and socio-demographic factors

| Students Characteristics | N | Alcohol | χ^2 p-value | Tobacco | χ^2 p-value | Marijuana | χ^2 p-value |
|---------------------------|-----|-----------|------------------|----------|------------------|-----------|------------------|
| Gender | | | | | | | |
| Male | 239 | 188 (79%) | < 0.001 | 68 (29%) | < 0.001 | 54 (23%) | < 0.001 |
| Female | 270 | 167 (62%) | | 20 (7%) | | 10 (4%) | |
| Ethnicity | | | | | | | |
| Indian | 321 | 224 (70%) | 0.671 | 61 (19%) | 0.025 | 40 (13%) | 0.203 |
| African | 66 | 43 (65%) | | 3 (5%) | | 4 (6%) | |
| Mixed | 109 | 80 (73%) | | 23 (21%) | | 17 (16%) | |
| Other | 8 | 5 (63%) | | 1 (13%) | | 2 (25%) | |
| Religion | | | | | | | |
| Muslim | 55 | 17 (31%) | < 0.001 | 7 (13%) | 0.278 | 4 (7%) | 0.022 |
| Hindu | 160 | 123 (77%) | | 26 (16%) | | 19 (12%) | |
| Christian | 260 | 190 (73%) | | 47 (18%) | | 31 (5%) | |
| Other | 27 | 22 (81%) | | 8 (30%) | | 9 (33%) | |
| Monthly income | | | | | | | |
| < \$250 | 12 | 6 (50%) | 0.227 | 1 (8%) | 0.182 | 1 (8%) | 0.301 |
| \$250 – \$800 | 68 | 42 (62%) | | 14 (21%) | | 5 (7%) | |
| \$800 – \$1600 | 152 | 111 (73%) | | 20 (13%) | | 17 (11%) | |
| \$1600 – \$2400 | 94 | 69 (73%) | | 20 (21%) | | 14 (15%) | |
| > \$2400 | 115 | 80 (70%) | | 27 (24%) | | 20 (17%) | |
| Father's Education | | | | | | | |
| Primary and under | 73 | 42 (58%) | 0.022 | 8 (11%) | 0.215 | 4 (6%) | 0.106 |
| Secondary | 220 | 164 (75%) | | 44 (20%) | | 33 (15%) | |
| Tertiary | 203 | 140 (69%) | | 36 (18%) | | 26 (13%) | |
| Mother's Education | | | | | | | |
| Primary and under | 67 | 44 (68%) | 0.165 | 7 (10%) | 0.095 | 4 (6%) | 0.197 |
| Secondary | 284 | 192 (68%) | | 48 (17%) | | 40 (14%) | |
| Tertiary | 148 | 112 (76%) | | 33 (22%) | | 19 (13%) | |

Table showing the breakdown of the six-month prevalence rates of alcohol, tobacco and marijuana use by gender, ethnicity, religion, monthly income and parents' education. Figures in parentheses indicate the number of individuals using the substance in the past 6 months as a percentage of the total number of individuals within that demographic. Chi-square testing was done to assess any significant relationships and the *p*-values are also noted.

tobacco was defined as smoking more than three times for the month and 9% of respondents were classified as such. On the other hand, current smoking is defined as having smoked on 1 or more days of the past 30-days and 82 persons (15%; 95% CI 14, 17) were identified as current users (33). Most people used cigarettes as their source of tobacco (94% of smokers), 30% used cigars and 6% and 2% used rolled tobacco and chewed tobacco respectively. The mean (\pm standard error) number of cigarettes used per day was 11 ± 1.6 . Two-thirds of tobacco users indicated that their use had increased since their enrolment at university.

Tobacco use was more common among men than women [77% vs 23%] ($p < 0.001$) and persons of African descent were much less likely to use tobacco ($\chi^2 = 9.31$, $df = 3$, $p = 0.025$); only four users were of African descent, representing 6% of all Africans sampled. No other correlations were noted for tobacco six-month prevalence rates or

amongst regular users with respect to religion, ethnicity and family income.

Problems associated with tobacco use included: fifty per cent (50%) of users experienced cravings and 40% reported being unable to get through a week without using tobacco. These and other problems are summarized in Table 3.

Marijuana

Sixty-four persons (13%; 95% CI 10, 16% of respondents) said that they used marijuana in the past six-months; the majority of users (55%) indicated fairly infrequent use, < 3 times per month, while the rest ranged from daily use (14%) to several times weekly (15%) and several times monthly (14%).

Like tobacco and alcohol use, it was found that the proportion of males that used marijuana was larger than for females, as 10 females admitted to using marijuana and 54

Table 3: Problems associated with substance use

| | Alcohol | | Tobacco | | Marijuana | |
|---|---------|------------|---------|------------|-----------|------------|
| | Numbers | % of Users | Numbers | % of Users | Numbers | % of Users |
| Hospitalized | 5 | 1 | 0 | 0 | 35 | |
| Unconscious | 34 | 10 | 0 | 0 | 00 | |
| Feel sick when not using | 16 | 5 | 13 | 15 | 23 | |
| Cravings | 63 | 17 | 44 | 50 | 12 | 19 |
| Problems with family/friends | 61 | 17 | 28 | 32 | 15 | 23 |
| Unable to get through one week without using the substance | 43 | 12 | 35 | 40 | 12 | 19 |
| Lost friendships | 34 | 10 | 13 | 15 | 914 | |
| Missed classes | 103 | 29 | 8 | 9 | 17 | 27 |
| Done something illegal to procure substance | 14 | 4 | 6 | 7 | 14 | 22 |
| Been in trouble with law | 11 | 3 | 3 | 3 | 12 | 19 |
| Been in fights | 45 | 12 | 4 | 4 | 46 | |
| Three or more problems | 96 | 27 | 65 | 74 | 45 | 70 |

Students were asked to indicate what problems they directly related to their use of alcohol, tobacco and marijuana. Table shows breakdown of numbers and % of users that experienced key problems.

males reported to using the substance. Marijuana use among persons of African descent was 6% (95% CI 0.3, 12) as compared to Indians 12.5%, (CI 9, 16) and mixed descent individuals of 15.5% though this was not significant ($\chi^2 = 4.60$, $df = 3$, $p = 0.203$).

Three respondents indicated that they had been hospitalized in the past six-months as a result of their marijuana usage and 12 said that they had been in trouble with the law as a result of such use; another 12 (19%, 9, 29) said that they "craved" marijuana when they were not using it. Twelve persons (19%) claimed that they could not get through the week without using marijuana. These and other problems are summarized in Table 3.

As with alcohol and tobacco, participants were also asked how their consumption of marijuana changed upon entering the UWI, the results showed that of the students using marijuana, 36 (56%) reported an increase in their use upon entering UWI, 5 (8%) said their consumption decreased, while 23 (36%) showed no change in their use of the substance.

Multiple Substance Use

Fifty-two persons (10%) [95% CI 7, 13] of the total sample indicated that they used alcohol, tobacco and marijuana in the past six-months. Eighty-five persons (17%) [CI 14, 20] of the total sample used alcohol and tobacco during the past six-months. All marijuana users also reported using alcohol.

DISCUSSION

Alcohol use is believed to be an endemic problem within the Caribbean region though minimal research has been done to

confirm this, quantify the extent of use and any particularly vulnerable subsets of the population. Reports from other regions highlight that alcohol use tends to peak during university years, a time when students are most willing to experiment with substances and are often prone to social influences.

In this study, the prevalence rate of alcohol use during the previous six-months among students at the St Augustine Campus was 70% with little drop off for 30-day prevalence rates. These figures suggest that the rates of alcohol use are fairly high and are consistent with reports among high school students in Trinidad and Tobago and Jamaica, highlighting the fact that there is little decline in use as students progress into university (20, 22). The data of the present study are also consistent with studies from many other regions including the USA (34), the United Kingdom (35), Europe (24) and the Middle East (30) and is perhaps symptomatic of the heavy cultural influence of British and North American society within the English-speaking Caribbean and Trinidad and Tobago, in particular.

Beyond six-months prevalence rates, 28% of persons were classified as regular users (using alcohol several times a month or more) and 31% of persons admitted to binge drinking. Not surprisingly, two-thirds of students who regularly use alcohol had seen their usage of alcohol increase since entering university, this being consistent with reports in the literature about the profile of alcohol use over time (11). This number of regular users and those who participate in binge drinking, though much lower than those found in other countries, is perhaps more concerning than the data related to six-month prevalence. It suggests that while overall preva-

lence rates are similar to other Western nations the number of 'problem drinkers' may be less. The reasons for this are unclear but they may reflect the fact that many of the typical social activities that university students engage in at the St Augustine campus UWI have not been traditionally associated with alcohol use, though this appears to be changing.

Despite the lower number of regular users in this study, these figures are still fairly high. Indeed, given the problems that students themselves associate with alcohol use (hospitalization, cravings, missed classes) there is still a need for further intervention strategies to be considered. In fact, 50% of students indicated problems while using alcohol which suggests that alcohol use may be having deleterious effects on at least half of all users. Even with reports of hospitalization, lawless activity, violence, missing classes and losing consciousness, only five per cent of students associated their alcohol use with a decline in academic performance.

Men were more likely to have used alcohol in the past six-months and also to be regular consumers of alcohol and binge drinkers, something that is almost universally consistent across national and ethnic boundaries. The data highlight no significant correlations between alcohol use among ethnic groupings. A recent study out of the USA suggests that there are ethnic differences in alcohol use but they noted that Whites and Hispanics were more likely to use alcohol than Asian and African Americans (23).

Regarding religion, it has been noted that spirituality or religiosity can moderate the use of alcohol and other substances (29) and in Trinidad and Tobago, Hindu high school students have been shown to be more likely to consume alcohol than their peers (22). The results of this study offer some support for this with Muslim students being the least likely to have used alcohol or be classified as regular users when compared to Hindus and Christians. This result probably reflects the teachings of the Muslim faith which advocates the avoidance of alcohol. No attempt was made to determine strength of religious convictions which may be important for future studies as Ghandour *et al* noted that "believing in God and *practising one's faith* were related inversely to alcohol abuse and dependence in all religious groups" as opposed to simply identifying with a particular faith (30).

The educational level of students' parents and family income were used to give some indication of the socio-economic status of the students. It was observed that prevalence rates for alcohol use within the past six-months were lower if the father's level of education was primary school or lower; it should be noted that this was not found to be true among regular users of alcohol. There were no differences observed between students from different income brackets either with respect to six-month prevalence of alcohol use or among regular users. Taken together, our results suggest that socio-economic status did not predispose students to use alcohol. Reports from Europe (24, 36) have observed an

increase in alcohol use and abuse among those of a higher socio-economic bracket and it has been suggested that alcohol abuse may be considered a disease of affluence. The data do not support this and might simply reflect the overall lower standard of living within the region which might reduce overall social distance among Trinidad and Tobago society.

Tobacco

In this study, 17% of those sampled had used tobacco products during the past six-months with just over half or 9% of the total sample being classified as regular users of tobacco. The 30-day prevalence rate for current smokers was 15%. This was much lower than 30-day prevalence rates for studies carried out in the USA (13, 14). It was also lower than a recent study in Pakistan (37), data from the Caribbean among high school students (20, 22) and that from most countries surveyed by Steptoe *et al* (16). These results are somewhat encouraging and suggest that smoking is not as widespread a problem among university students in Trinidad and Tobago as in other nations and may reflect that, culturally, smoking has not been widely embraced in Trinidad and Tobago society.

Smoking was more common among males than females. From a public health point of view, this is encouraging as many studies among adolescent youth indicate that there is little gender difference (38). Persons of African descent were three times less likely to have used tobacco during the past six-months or use it on a regular basis when compared to persons of Indian and mixed descent. This may be a result of the under-representation of Africans in those sampled as there are no reports of similar findings elsewhere and findings among high school students in Trinidad indicate the reverse (22). No other correlations were demonstrated with respect to prevalence and regular use of tobacco.

Marijuana

We report a six-month prevalence rate of marijuana use of approximately 13% with just under half or 6% of the total sample being regular users. Again males were much more likely to have used marijuana but no clear relationship was established with respect to ethnicity, religion or socio-economic background. These rates are slightly lower than those reported in the USA but similar to those reported by Singh *et al* among high school students; however, the ethnic distribution was different to that previously reported among high school students (22).

Public Health Risk

For all substances surveyed (alcohol, tobacco and marijuana), students indicated that their use of these substances had profound effects upon their functioning with reports of absenteeism, hospitalization, inter-personal problems and suggestions of dependence. Such findings are consistent with the known public health risks of substance use and

abuse and suggest that more needs to be done to educate the population of university students in Trinidad and Tobago about the attendant risks of such behaviour. At present, there is limited education on these substances. In addition, 10% of those sampled reported using all three substances; such clustering is not uncommon (39, 40) and highlights a particularly at risk group of individuals.

Limitations

In this study, students self-reported on their use of substances and it has been observed that self-reporting tends to underestimate substance use (41). In addition, convenience sampling was used to collect the data by visiting areas of the campus where students tend to congregate including the library, cafeteria and popular recreational locations on campus. This obviously might have excluded students who do not frequent these more popular locations. There is an under-representation of Afro-Trinidadians in the sample. Demographic data are unavailable for the entire student population at UWI but given the national percentage of Afro-Trinidadians is closer to 40%, the sample of 13% is low.

In summary, this is one of the first studies to examine substance use among university students at the St Augustine campus of The University of the West Indies. The data suggest that alcohol, tobacco and marijuana are used by significant percentages of students enrolled. Alcohol rates are comparable with North America and Europe but tobacco and marijuana usage appears to be reduced. In general, this usage is having a deleterious effect upon student life and we suggest that more educational programmes need to be put in place to help students appreciate the dangers of substance use (in particular, alcohol) and to also to help with attempts to reduce usage. We recommend that further research needs to be done to confirm the findings of this study, target specific subpopulations which may be at increased risk and assess any intervention strategies that may be implemented by the relevant authorities as a consequence of these findings.

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