PSYCHOLOGY AND EDUCATION (2020) 57(7): 531-536
An Interdisciplinary Journal

Review Article

Cigarette smoking and alcohol intake among high school learners in Pretoria, South Africa

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Abstract

Alcohol use and cigarette smoking among in-school youth remain a major public health problem globally. However, data on the prevalence of the use of these substances and associated factors are limited in sub Saharan Africa, including South Africa. The objectives of this study were to determine the prevalence of cigarette smoking and alcohol consumption, as well as associated factors, among high school learners in a township in Pretoria, South Africa. A cross sectional survey was used to collect data from a sample of 1087 high school learners attending high schools in a Pretoria township, South Africa. STATA version 13 was used to analyse the data. The sample consisted of 52% females (and 48% males (n=518). The prevalence of cigarette smoking and drinking of alcohol was 9% and 28% respectively. The mean age of initiation for cigarette smoking and drinking of alcohol was 14 years (SD= 2.1 years) and 15 years (SD=1.9 years) respectively. Being male was associated with both cigarette smoking and alcohol consumption. Boys were 2.3 times more likely to smoke cigarettes than girls and they were 1.4 times more likely to consume alcohol than girls. Personal choice and parental guidance were the most stated reasons for abstinence for both cigarette smoking and alcohol consumption.

Introduction and Background

The use of psychoactive substances by adolescents is an escalating public health problem on a global scale, (Degenhardt et al, 2016; Hall et al, 2016; Senanayake et al, 2018). In particular, low-and-middle-income countries (LMICs), including the sub-Saharan Africa region, are experiencing an increasing prevalence of cigarette smoking and alcohol use, which contributes to significant morbidities and mortalities (Lim et al, 2012; Jaquet and Dabis, 2017). The increasing prevalence of cigarette smoking and alcohol use in African countries has been attributed to the growing accessibility and affordability of alcohol and cigarettes, influential production and marketing campaigns by the alcohol and cigarette industries, and a breakdown in social and cultural norms that used to bind traditional African societies (Kalema et al, 2015).

The high prevalence of substance abuse among in-school youth in South Africa has been well reported (Tshitangano, & Tosin, 2016; Manu, Maluleke & Douglas, 2017), with alcohol use and cigarette smoking being the most commonly used substances (Forouzanfar, 2015; Morojele, Brook & Brook, 2016; Muchiri & dos Santos, 2018). Not only is alcohol intake in South Africa reported to be among the highest in the whole of Africa (Mogotsi et al, 2014), this trend has been reported among young people, with some studies suggesting that some youth in South Africa often drink with greater intensity than adults (Peer et al, 2013). As substance abuse increase, the age of experimentation is reported to be declining (Chinake, 2017; Olawole et al, 2018). Because both alcohol use and cigarette smoking have been extensively reported as gateway drugs (DuPont et al, 2018; Keyes, Rutherford & Miech, 2019), their use gives an indication of both current and future challenges of substance abuse in communities.

Over and above the social, mental and physical consequences of substance abuse among young people, the most significant challenges among in-school youth are poor academic performance (Mekonen et al, 2017; Vorster et al, 2019) which results from poor adherence to school discipline protocols (Lawal & Marafa, 2016; Sibiya, Gamede, & Uleanya, 2019), poor anger management (Zarshenas et al, 2017), as well as poor social skills and impulsiveness (Ahadi, 2016). The poor academic performance often results in dropping out of school, (Weybright et al, 2017; Desai et al, 2019). Substance abuse is therefore a major barrier to the achievement of the ultimate intendent education outcomes.

Problem statement, research questions and objectives

The trends of cigarette smoking and alcohol use is not consistent in South Africa, but shows geographic patterns which are determined by local influences and area culture (Doogan et al, 2017; Victor et al, 2017), hence the need to conduct studies in various areas of South Africa, which will assist in painting a picture of substance abuse trends in the country.

Research question:

The study responded to the following research questions:

a. What is the prevalence of cigarette smoking and alcohol use among high school learners in a Pretoria township?

b. What factors are associated with cigarette smoking and alcohol use among high school learners in this Pretoria township?

Objectives:

The objectives of the study were the following?

a. To determine the prevalence of cigarette smoking and alcohol use among high school learners in a Pretoria township.

b. To explore factors associated with cigarette smoking and alcohol use among high school learners in a Pretoria township.

Methodology

Study design

A quantitative cross-sectional survey was used for the study.

Study setting

The study was conducted in public high schools in a township in Pretoria in South Africa. The residents are predominantly Black.

Study population

The population consisted of high school learners from the eight high schools in the township. The estimated population size of the learners is 8700.

Sampling and sample size

A multistage cluster sampling technique was used as follows: Balloting without replacement method was used to randomly select three (3) out of the eight high schools in the township. Within each selected school, random selection of classrooms in grades 8 to 11 was conducted, and all the learners from the selected classrooms were invited to participate in the study. A survey was conducted among learners who were in the selected grades 8 to 11 classes, who agreed to participate, and whose parents/guardians provided signed consent. Using a Raosoft sample size calculator, with a 5% margin of error, confidence level of 95% and response distribution of 50%, a minimum sample size of 368 was calculated. A total of 1089 learners participated in the study.

Data collection

Data were collected using a questionnaire which was adapted from the 2017 National Youth Risk Behaviour Survey of the Centres for Disease Control and Prevention, to which socio-demographic questions were added. On the date of data collection at each school, learners who met the inclusion criteria were assembled in a school hall, where the purpose of the study and the data collection process was explained. The learners were given an opportunity to ask questions or seek clarifications, which was followed by the administration of participant assent. Learners indicated their preferred language as the questionnaires were available in English, Sepedi or Setswana. The questionnaires were then distributed, participants were given time to fill them in and the filled in questionnaires were collected by the researcher and the two research assistants.

Data analysis

The raw data were captured in Microsoft Excel spreadsheet, coded and transported to Stata version 13 for analysis. Socio-demographic data were analyzed descriptively, and yielded the prevalence of cigarette smoking and alcohol intake in the sample. Logistic regression was used to explore associations between cigarette smoking and alcohol drinking and a range of socio-demographic variables, using a significance level of $p < 0.05$.

Ethical considerations

Ethical clearance to conduct the study was obtained from Sefako Makgatho Health Sciences University Research Ethics Committee. Permission to conduct the study was obtained from the local District office of the Department of Education and the principals of the schools. The parents of the learners who were under the age of 18 years and learners who were 18 and above provided informed consent, and all minor participants provided assent.

Results

One thousand and eighty-seven learners who were in grades 8 to 11 participated in the study. The gender ratios were 52% females (n=569) and 48% males (n=518). Their ages ranged from 12 to 22 years, with a mean of 17 years (SD = ±1.8 years). Fewer students were sampled in the lower grades, because the learners in these grades were mostly under 18 years of age, and some of their parents did not consent to their participation.

Table 1 shows the grade representation of the sample, while table 2 shows the demographic characteristics of the participants.

Prevalence of smoking and alcohol use

As illustrated in table 3, the prevalence of smoking amongst learners was 9.0% (n=98), with the mean age of initiation for cigarette smoking of 14.4 years (SD= 2.1 years). The prevalence of alcohol use was 28.3% (n=308) and the mean age of initiation for alcohol intake was 15.1 years (SD=1.9 years).

Table 1: Grade representation of the sample

Grade	Number	Percentage
8	157	14
9	232	21
10	355	33
11	343	32
Total	1087	100

Table 2: Demographic characteristics of the participants.

Variables	Categories	Frequency	Percentages
Gender (n= 1087)	Male Female	518 569	47.7 52.3
Age in years (n= 1087)	12-15yrs 16-18yrs 19-22yrs	321 585 181	29.5 53.8 16.7
Grades (n= 1087)	Grade 8-9 Grade10-11	389 698	35.8 64.2
Number of children in households (n=1087)	Less than 2 More than 2	340 747	31.3 68.7
Employment status of parents (n=1087)	Employed Unemployed	932 155	58.7 14.3
Father's education (n=594)	No formal schooling Primary school Secondary school Tertiary	13 41 253 287	2.2 6.9 42.6 48.3
Mother's education (n=748)	No formal schooling Primary school Secondary school Tertiary	12 33 421 282	1.6 4.4 56.3 37.7

Table 3: Smoking, alcohol use and age of initiation

Variables	Categories	Frequency	Percentages
Cigarette smoking (n=1087)	Yes No	98 989	9.0 90.9
Age started cigarette smoking (n =94)	6-11 years 12-15 years 16-17 years 18 years and above	12 49 33 0	12.8 52.1 35.1 0.0
Drink alcohol (n=1087)	Yes No	308 779	28.3 71.7
Age started drinking (n =314)	6-11 years 12-15 years 16-17 years 18 years and above	11 171 98 34	3.5 54.5 31.2 10.8

Associations between cigarette smoking and alcohol use and demographic variables

Logistic regression was used to explore the association between both cigarette smoking alcohol use and demographic variables. Tables 4 and 5 show these associations.

Being male and an increase in age were found to be significantly associated with alcohol use and smoking. Males were 2.3 times more likely to smoke than females (p=0.000). The 16 -18 year olds had a 1.5 higher odds of smoking cigarettes than the 12-15 year olds (p=0.006).

Table 4: Factors associated with cigarette smoking.

Variables	Odds Ratios	95% CI	*p-value*
Gender	2.337943	1.492849 3.661438	0.000
Age	1.676519	1.159169 2.424769	0.006
Grades category	1.104022	.5897785 2.06665	0.757
No. of children in household	1.616702	.7907418 3.305408	0.188
Parents employment	.661442	.335977 1.302189	0.232
Father's education	.7626775	.3101162 1.875674	0.555
Mother's education	1.026604	.3562622 2.958259	0.961
Religion	.6484611	.4114274 1.022056	0.062
No. of friends smoking	1.777218	.8921464 3.540344	0.102

Table 5: Factors associated with alcohol use.

Variables	Odds Ratios	95% CI	*p-value*
Gender category	**1.357626**	**1.030814 1.788051**	**0.030**
Age category	**1.869178**	**1.48073 2.35953**	**0.000**
Grades category	1.047483	.7065975 1.552824	0.817
No. of children in household	.9497805	.5974191 1.509967	0.828
Parents employment	1.201173	.8316314 1.734923	0.329
Father's education	.8371041	.4574138 1.531968	0.564
Mother's education	.9052385	.4717284 1.737137	0.765
Religion	.815269	.5998168 1.108111	0.192
No. of friends drinking	.7088243	.3249418 1.546221	0.387

Table 6: Main reason for abstinence (n=740).

Reason	Frequency	Percentages
Personal choice	451	60.9%
Parental guidance	155	20.9%
Involvement in sports	71	9.6%
Religious influence	44	5.9%
Friends not using substances	19	2.6%

The 19-22 year olds had a 4.3 higher odds of smoking than the 12-15 year old (0.006). Furthermore, boys were 1.4 times more likely to drink than girls (p= 0.030). The 16- 18 year were 2.3 times more likely to drink than the 12-15 year olds (p= 000). The 19-22 year olds were 4.6 times more likely to drink than the 12-15 year olds (p= 000).

Of the learners who did not smoke or drink alcohol, personal choice (60.9%) and parental guidance (20.9%) were the mostly cited reasons that influence their choices, as shown in Table 6.

Discussion

The increase in use of psychoactive substances among young people can be explained by the adolescents' tolerance for deviance, with adolescents with higher tolerance for deviance being more likely to smoke compared to abstainers (Macy et al, 2019). However, this concept was not tested in the current study. With the increasing trends towards the use of hard drugs by adolescents, cigarette smoking may be viewed as a 'lesser evil'. However, it has been associated with depression, especially those in socio economically disadvantaged, such as the current sample. Cigarette cessation interventions can thus be appropriately considered as an element of prevention of depression among adolescents (Tomita & Manuel, 2020).

The high prevalence of both cigarette smoking and alcohol intake is concerning, especially because due to age restrictions, the use of both substances is illegal for most of the participants. The finding that the prevalence of both cigarette smoking and alcohol intake is higher among males is consistent with other studies conducted in Sub Saharan Africa (Ekpenyong, 2012; Kyei and Ramagoma, 2013; Cherian et al, 2014; Ferreira-Borges et al, 2017). This has been explained by masculine norms such as containing expression of emotions, the drive to win at all costs, the perceived ability to consume large amounts of alcohol etc., as these drive males towards smoking and drinking behaviors (Iwamoto & Smiler,2013). However, a study done by Mogotsi et al, (2014) found no significant differences between male and female groups in terms of how often they drink beer, wine and spirits. The differences between the results of the two studies may be due to the culture of the different areas, which has been found to influence drinking behavior, hence the need for cultural competence of substance abuse prevention interventions (Hecht, & Krieger, 2006). In the current study, boys had 2.3 higher odds of smoking than girls and 1.4 times odds of drinking, suggesting that compared to smoking, the gender gap for drinking is less. Mogotsi et al, 2014 further states that the gender gap is lessening due to peer pressure among female adolescents, who are continue to adopt norms which were previously considered to be masculine.

This study also found that smoking and drinking increased with age, which is similar to other South African studies (Morojele, 2016; South African Demographic and Health Survey, 2016; Peer et al, 2013). This is cause for concern, as it may not only negatively impact on academic progress that results in dropping out of school, but also continue to alcohol use behaviour in adulthood, (Ekpenyoung et al, 2012; Mogotsi, et al, 2014; Cherian et al, 2014). This finding highlights the need for school-based interventions for these substances which are commonly used among learners. The findings of this study provide implications for policies and programs to prevent or delay the onset of cigarette smoking and alcohol use. Smoking was found to have a lower mean age of initiation than alcohol (14.4 years versus 15.1 years), which suggests that comprehensive preventative strategies and programs for this age group should be developed.

Reasons for abstinence are relevant for the comprehensive consideration of reducing risk factors, hence the enquiry regarding abstinence for the sample. Some of the learners abstained from alcohol use or smoking and more than half of them stated that it is their personal choice. While less than a third of them cited parental supervision as the reason for not using these substances suggesting that interventions

should focus on reducing adolescents' smoking and drinking by enhancing their self-control and resilience. Furthermore, these interventions should improve parental supervision and monitoring of alcohol use and smoking. According to Wang (2015) parental support inhibits early initiation of alcohol use and lower frequency of alcohol use among youth.

Over and above the association between cigarette smoking and physical health, cigarette smoking has also been associated with a variety of mental health problems (King et al, 2018; Riehm et al, 2019; Harrison et al, 2020) which are likely to impact negatively on the academic performance of the affected leaners. Cigarette smoking has been associated with depression (Tomita & Manuel, 2020) and adult substance abuse (Strong, Juon & Ensminger, 2016 Cigarette smoking has other health implications, which impact negatively on the functionality and over-all well-being of young people, which include a significant relationship between compromised quality of sleep and cigarette smoking among adolescents (Chang et al, 2018).

The lessening gender gap for alcohol consumption and the increasing use of alcohol with age is of concern, because alcohol consumption is identified as a risk factor for many cancers including breast cancer in women (Qian et al, 2014; Odutola, 2017). On the educational front, alcohol consumption is associated with poor academic performance which plays out as absenteeism, truancy and delinquency (Chauke, Van der Heever & Hoque, 2015). Additionally, alcohol use has also been associated with negative mental health outcomes among young people (Tembo, Burns & Kalembo, 2017), which includes depression (Skogen et al, 2016). These mental health problems may persist into adulthood where they have contributed to serious antisocial behaviours which include criminal and offending behaviour (Mela et al, 2020). On a long term basis, alcohol use has been associated with financial strain (Grafova, 2011) and food insecurity among low-income families (Armour, Pitts & Lee, 2008) and in adulthood.

Because of the association between both cigarette smoking and alcohol use with mental disorders, the results of this study should be viewed as the potential early stages of mental disorders for some of these learners, hence the need for comprehensive interventions that will integrate policy, organisational, educational, environmental and economic strategies that will help to reduce alcohol related harms among university students.

The need to screen for substance abuse in schools may benefit the long term strategy because it enables timely interventions on risky behaviors, and may help reduce the negative long term outcomes such as poor academic performance, poorer mental health, poorer physical health, higher delinquency and poorer social functioning (Dunbar et al, 2018).

Conclusion

Both cigarette smoking and alcohol use have high cost in the form of disability-adjusted life years, and this applies more in developing countries (Rehm et al, 2009; Peacock et al, 2018). This calls for urgent and focused interventions to counter-act this among young people.

School-based interventions to address both cigarette smoking and alcohol use, have been found to be effective (Nishio et al, 2018). Moreover, interventions need to be comprehensive to focus on policy, educational and environmental domain, for maximum impact. The school system has the capacity to influence young people in a variety of spheres in their lives, and strategies to shield them from the harms of both cigarette and alcohol use is a big part of the responsibilities of the education system.

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