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Original Research Article

An assessment of factors associated with shisha smoking among students at Evelyn Hone College, Lusaka, Zambia

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ABSTRACT

Background: Shisha smoking in Zambia, referring to the way of smoking tobacco in which the vapor passes through water before inhalation, is seen as a new practice, especially among youths of 18 to 25 age group. Factors associated with this practice have not yet been established. This study aimed at assessing the factors associated with shisha smoking among students at Evelyn Hone College.
Methods: A cross-sectional study was conducted on 347 Evelyn Hone College students selected using convenience sampling method. Data collection was by pre-tested semi-structured questionnaires. Chi-squared statistical tests were used to determine the association between the independent variables, which were demographic, social, environmental, cultural and personal factors, and the dependent variable being shisha smoking using SPSS version 18.
Results: The study revealed that shisha smoking was significantly associated with age of the smoker, level of income, peer pressure and knowledge levels of the smokers on adverse effects associated with shisha smoking. These relationships were determined by the logistical regression output which showed that age [OR=1.802 (1.152-2.818), p<0.05)], friends smoke cigarette/shisha [(OR=4.417 (1.760-11.086), p<0.05)], monthly allowance/income [(OR=0.663 (0.456-0.965), p<0.05)] and perceived risk [(OR=0.084 (0.046-0.154), p<0.05)] which all showed significant association with shisha smoking.
Conclusions: Interventions to reduce or quit shisha smoking among students need to have extended policies that apply to cigarette smoking. Additionally, health education campaigns against shisha smoking should as well be packaged in the anti-smoking messages targeting the youths.

Keywords: Association, Factors, Shisha, Smoking, Youths

INTRODUCTION

Shisha smoking in Zambia is considered a new practice, especially among the youths of 18 to 25 age group yet increasingly attracting more customers, especially from the above cited age group.

Shisha is a modified way of tobacco smoking in which the tobacco smoke is allowed to pass through water before being inhaled by the smoker.[1,2] Shisha is known by several names among which are waterpipe, Narghile, hookah and Hubble bubble, derived from from the word 'haqqa', which means "pot or jar". The device used for smoking shisha is made of a modified waterpipe which

has a head, body, bowl, and hose with a mouthpiece. Smokers inhale through the mouthpiece and hose, drawing air over lit charcoal placed on the head of the device. Approximately 10-20 gm of tobacco and 5 gm of charcoal are used per shisha session lasting not less than 60 minutes. Shisha smoking is alleged to be more toxic as compared to common tradition- tobacco smoking.[3]

Most shisha commercial packages come without any labelling regarding its harmful effects on the health of consumers, thus depriving users with informed decisions prior to usage. According to the Zambian Public Health (Tobacco) Regulations of 2006, print warning that 'tobacco is harmful to health' should appear on both sides of the surfaces of tobacco consumption packaging in letters against a contrasting background.

Much of the efforts have been made in some sub-Saharan African countries, such as Zambia in addressing the burden of tobacco use in cigarette smoking. Sub-Sahara African countries, including Zambia, have intensified promotion campaigns directed at young people.[4,5] The aim of such promotions has been to put across the message that better knowledge about tobacco use at the early stages of the epidemic could help public health interventions. It can be noted that most of the endeavours have targeted the usage of tobacco through cigarette smoking, but centrally, with insignificant documented campaigns targeting tobacco smoking in the mode of shisha. Yet this mode of tobacco usage posed a number of health risks exacerbated by consequences arising from tendencies of sharing the mouthpiece among several users in the smocking process. Jukema and his colleagues note that the dangers of shisha smoking are not limited to the degree of exposure to toxic chemicals present in the tobacco, but extend to transmission of infectious diseases such as tuberculosis, herpes (HSV 1) and oral bacterial infections due to the sharing of the mouthpiece in the shisha smoking.[4]

Currently, an estimated 5.4 million people die worldwide each year due to diseases attributed to tobacco smoking.[6,7] It is estimated that the mortality rate of tobacco smoking would rise to 8 million people by the year 2030 in the absence of appropriate interventions.[8] However, the scarcity of statistics on shisha smoking to aid interventions remain wanting.

Unlike tobacco smoking, commonly consumed by an individual smoker for approximately 5 minutes, the practice of shisha smoking typically involves group-smoking and lasts for more than an hour. From a walk through survey it was noted that shisha was commonly served in restaurants, cafes and bars where second-hand smoke exposure could be a health risk to non-smokers in the vicinity. Shisha smokers often inhale more smoke than cigarette smokers because of the length of time a shisha session lasts. Some studies have suggested that shisha smoking could be more harmful than cigarette smoking.[9]

It has been established that tobacco smoke generated over 4,800 different chemicals out of which 69 were carcinogenic and lead to the development of neoplastic diseases.[10] In addition to tobacco smoke exposure, shisha smokers were also exposed to other toxic substances such as nicotine produced from charcoal which is used to burn tobacco.[1,11]

Shisha smoking has been reported as commonly practiced among the youths of 18 to 34 age group in institutions of higher learning such as Universities and Colleges.[12] Therefore, the proposed study was aimed at determining compelling factors that would be responsible for increasing trends in shisha smoking among the youths at institutions of higher learning such as Evelyn Hone College.

METHODS

This was a cross-sectional study carried out at Evelyn Hone College of Applied Arts and Commerce (EHC) in Lusaka, Zambia, from February 2017 to April 2017. The study population who met the inclusion criteria and included in the study were students aged from 18 to 35 years enrolled at EHC for the 2017 academic year. The students who were not registered with EHC and not registered for the 2017 academic year were excluded from the study.

Since studies on shisha smoking have not been explored in Zambia, 50% was used as an estimate in the expected prevalence or proportion. Using a precision formula, a sample size of 422, taking into account 10% possible non-response was determined and used in this study. For the purposes of data collection, the convenient sampling technique was used.

Equation for sample size determination

$$n = \frac{Z^2 p(1-p)}{d^2}$$

Where, 'n' is sample size, 'Z' is the Z statistic for a level of confidence, 'p' is expected prevalence or proportion (in this case the expected prevalence is 50 %, thus p=0.5), 'd' is precision (at 95% CI, this will be 5%, thus d=0.05).

This gave a sample size of 422, taking into account 10% non-response.

Data were collected from the 347 participants using pretested semi-structured interviewer-administered questionnaire. Two students who were not included in the study were recruited and trained to collect data using a questionnaire. Upon collection, the data was cleaned up for duplications, spellings and coding. Thereafter, the analysis was done using SPSS version 18 statistical tool. Frequency and contingency tables were generated to show the distribution of data. Chi-squared tests were used to examine univariate association between categorical

variables and an outcome of interest, namely shisha smoking. Furthermore, multivariate logistic analysis was used to examine factors associated with shisha smoking. In the multivariate logistic analysis, all variables with $p<0.05$ in the univariate analysis was entered as a single block into the model (simultaneous forced entry). Adjusted odds ratio (OR) and 95% confidence interval (CI) were calculated.

Ethical clearance was obtained from the Research and Ethical Committee of The University of Lusaka and permission to commence collecting data was given by the EHC Management. Individualized consents was were obtained from the study participants.

RESULTS

Out of four hundred and twenty-two administered questionnaires, three hundred and forty seven were completed and returned thereby giving a response rate of 82.2%.

Table 1: Socio-demographic characteristics of respondents.

Variable	Frequency	%
Mode of study		
Regular	237	68.3
Extension	110	31.7
Total	347	100
Gender		
Male	247	71.2
Female	100	28.8
Total	347	100
Age (in years)		
≤20	82	23.6
21 to 24	178	51.3
25 and above	87	25.1
Total	347	100
Religion		
Christianity	343	98.8
Muslim	4	1.2
Total	347	100
Type of family		
Nuclear family	183	52.7
Single family	66	19.0
Extended family	98	28.2
Total	347	100

Socio-demographic characteristics of participants

In Table 1 the majority (68.3%) of the participants pursued their education on full-time mode while about a quarter (31.7%) of them were on flexible learning mode of study. Nearly three quarters (71.2%) of the respondents were males while the rest were females. About 50% of the respondents belonged to the age group from 18 to 24 years old. Most (98.8%) of the respondents were of Christian faith while 52% came from a nuclear family.

Shisha smoking status by gender of participants

With respect to gender, the majority (27%) of males agreed to smoking shisha compared to 12% for females. Forty-four percent (44%) of males indicated that they had not smoked shisha before compared to 16% for females. The majority (37%) of the respondents who indicated that they smoked shisha had friends who also smoked tobacco in cigarette or shisha and only (2%) of the respondents who indicated that they smoked shisha had friends who did not smoke tobacco through cigarette or shisha.

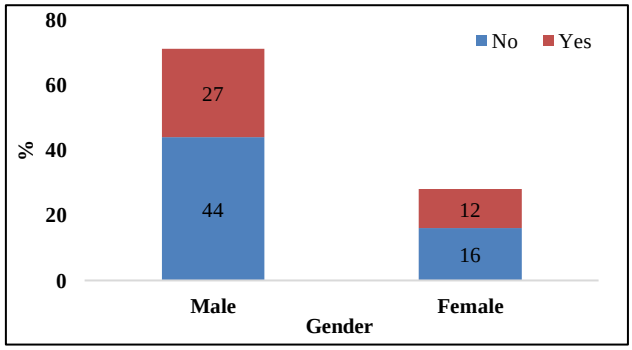

Figure 1: Shisha smoking status by gender of the respondents.

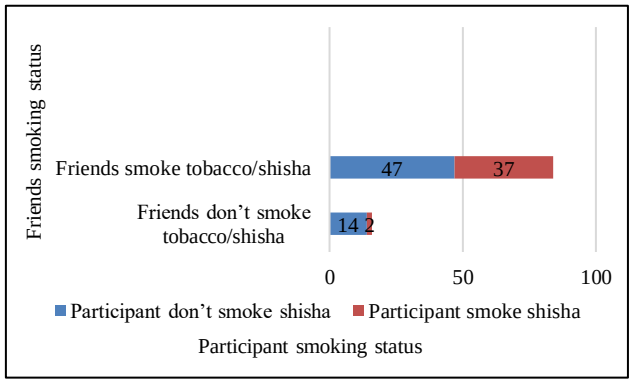

Figure 2: Respondents smoking status versus friends smoking status.

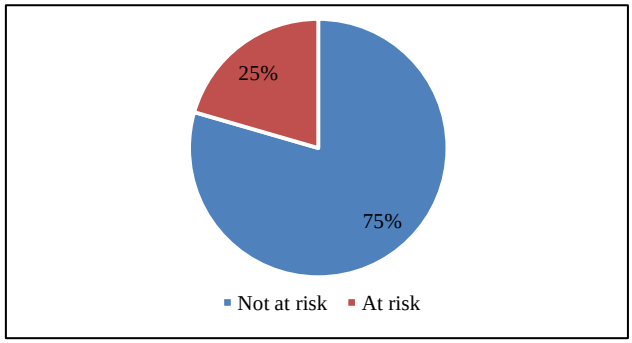

Figure 3: Respondent's knowledge of health risks associated with shisha smoking.

Thirty-one percent (31%) of the respondents who indicated that they smoked shisha were of the view that shisha smoking was not a risk to their health compared to only 8% who indicated that it was a risk to their health. Results are presented in Figures 1, 2 and 3.

Univariate analysis of factors associated with shisha smoking among the participants

A negative correlation between gender and shisha smoking was observed. Additionally, data showed that the relationship between gender and shisha smoking was not statistically significant (p=0.394). The majority (57.7%) of the participants who indicated they smoked shisha belonged to the age group of 21 to 24 years. From Table 2, it was revealed that age positively correlated to shisha smoking and the relationship between the two variables was statistically significant (p=0.015). It was further observed that there was a negative association between type of family a participant belonged to and shisha smoking.

Table 2: Association of demographic factors and shisha smoking among students.

Variable	N (%)	r	P value
Gender			
Male	94 (68.6)		
Female	43 (31.4)	-0.046	0.394
Total	137 (100)		
Age (years)			
≤20	35 (25.5)		
21 to 24	79 (57.7)	0.118	0.015
>25	23 (16.8)		
Total	137(100)		
Type of family			
Nuclear family	66 (48.2)		
Single family	29 (21.2)	-0.65	0.385
Extended family	42 (30.7)		
Total	137 (100)		

Triggers of shisha smoking among the youths

The majority (98.8%) of the respondents among those who smoked shisha were Christians and the rest were Muslims. There was a negative association between religion and shisha smoking. The association was statistically significant (p=0.013) as shown in Table 3.

Table 3: Association of religion and shisha smoking among students.

Variable	N (%)	r	P value
Type of religion			
Christianity	133 (98.8)		
Muslim	4 (1.2)	-0.134	0.013
Total	137 (100)		

The study also showed that there was a negative association between challenges accessing shisha and shisha smoking as shown in Table 4. The study further showed that there was a negative association between shisha smoking and perceived risk (p≤0.001). The association was statistically significant. Reasons was smoking shisha (for enjoyment and reducing stress was positively associated with shisha smoking, though the association was not statistically significant as shown in Table 5.

Table 4: Association between accessibility and shisha smoking among students.

Variable	N (%)	r	P value
Challenges accessing shisha			
Yes	37 (27.0)		
No	100 (73.0)	-0.103	0.219
Total	137 (100)		

Table 5: Personal and social factors associated with shisha smoking among students.

Variable	N (%)	r	P value
Reasons for smoking shisha			
Enjoyment	95 (69.3)		
Reducing stress	42 (30.7)	0.155	0.065
Total	137 (100)		
Monthly income			
Less than K500	56 (40.9)		
Between K500 and K100	51 (37.2)	0.074	0.040
Above K1000	30 (21.9)		
Perceived risk			
At risk	28 (20.4)		
Not at risk	109 (79.6)	-0.603	<0.001
Total	137 (100)		

Multivariate analysis of factors associated with shisha smoking among the participants

The multivariate logistic regression model was performed to assess the variables associated with shisha smoking and to control for the confounding factors.

Table 6: Multivariate analysis of factors associated with Shisha smoking among students.

Variable	OR	95% CI	P value
Age of smoker	1.802	1.152-2.818	0.010
Type of religion	0.000	0.00-0.00	0.999
Friends smoke cigarette/shisha	4.417	1.760-11.086	0.002
Monthly allowance/income	0.663	0.456-0.965	0.032
Perceived risk	0.084	0.046-0.154	<0.001

Controlling all these variables, Logistic-Regression Model identified that individual factors most strongly

associated with shisha smoking at Evelyn Hone College were; age of smoker, peer influence from friends who smoke cigarette or shisha), monthly allowance or income, and perceived risk as shown in Table 6.

DISCUSSION

The study assessed factors associated with shisha smoking among students at Evelyn Hone College. Given the dearth of epidemiological data describing different aspects of this emerging issue of public health importance in Sub-Saharan countries, this study has determined the factors triggering shisha smoking among students at one of the largest tertiary learning institutions in Zambia within Sub-Saharan Africa.

Sociodemographic characteristics of respondents

In this study, it was noted that most (68.3%) of the participants who smoked shisha were males. These findings agree with those of a similar study which was done in Thailand which indicated that 73% of shisha smokers at a University were male students. It was further noted that male students had more freedom of interacting with their peers than their female counterparts. This liberty could be among the factors that predisposed males to adopt the new lifestyle from their colleagues who were smokers. Furthermore, Jukema and his colleagues attributed such orientation with more males being smokers of tobacco also attributed to shisha as a common feature in most patriarchal societies where smoking is taken as a sign of masculinity and dominance in the social setting.[12]

Distribution of participants by mode of study, gender, age, religion and type of family

It was observed that there was a negative correlation between gender and shisha smoking, which entails that shisha smoking was more inclined to one type of gender, male students in this case. This association was, however, not statistically significant (p=0.394). The findings of this study are in agreement with reports that more male students smoked shisha compared to females.[5,8] Similarly, other researchers attested of gender difference in shisha smoking.[13,14] The results in this study are, however, in disagreement with a study of Poyrazoglu et al, who reported that gender was significantly associated with shisha smoking.[15]

The current study shows that the majority (57.7%) of the participant who smoked shisha belonged to the age group of 21 to 24 years. Age positively correlated to shisha smoking and was statistically significant (p=0.015). The results showed that the increase in age among students was associated with engagement in shisha smoking. Shisha smokers are more likely to engage in smoking as they advance in age from around 18 years onwards though less likely do so after 25 years. Akl and colleagues also found that indulgence in shisha smoking increased with increase in age.[1]

The study showed that most (48.2%) of the participants who smoked shisha belonged to a nuclear type of family compared to (21.2%) and (30.7%) for single family and extended family, respectively. Within this study, there is a negative association between type of family and shisha smoking. Nuclear type of family offers strengthened moral modelling regarding raising of children. By reaching agreements on discipline and modelling appropriate behaviour, both parents act as a team to strengthen and reinforce child behaviour which protects against engagement in bad practices including smoking. These results are in agreement with the findings which indicated that living in a nuclear family or adolescents who reside with both biological parents are less likely to smoke tobacco than those living with single parents.[16,17]

On the aspect of religion, the study shows that religion negatively associated with shisha smoking. This meant that students who belonged to a particular religion were less likely to smoke shisha than others who were less religiously devoted.[18] The association was statistically significant. The findings are in agreement with findings from other studies which indicated that religious beliefs were reversely associated with consumption of tobacco products.[19] The commitment to religion seems to play a protective role against the consumption of tobacco.[20] Religions such as Christianity, Judaism, Hinduism, Buddhism, and Islam have principles that forbid or discourage the use of addictive substances. Islam, for example, declares practices that are harmful to one's health to be forbidden.[21] Christianity as in the Roman Catholic Church discourages excess in smoking in Catechism 2290, which states that, "The virtue of temperance disposes us to avoid every kind of excess: the abuse of food, alcohol, tobacco, or medicine."[6] Temperance as a virtue is moderation or voluntary self-restraint to abusive substances or practices such as smoking.

The other factor that pointed to urge for shisha smoking was accessibility to shisha. Accessibility to shisha and shisha smoking were negatively associated. The less the challenges respondents faced accessing shisha, the more likely they were to engage in shisha smoking. Most social gathering places such as restaurants, pubs or clubs readily make shisha available for purchase hence making shisha easily accessible. These findings are in agreement with the findings from the studies done in Kenya, Malaysia and Kuwait where they affirmed that accessibility play a key role in promoting any form of smoking among the youths.[11,22-25]

Effects of peer pressure and income on shisha smoking status

An association between shisha smoking and influence from shisha-smoking friends was seen to exist in this

study. This positive association showed that respondents were likely to engage in smoking when their friends also smoked. These findings are comparable to finding from other studies which indicated that university and college students viewed shisha smoking with friends as a way of socializing.[26-28]

Given that some studies showed that most of the shisha users started with friends in cafes, restaurants or bars rendering the habit as a socializing activity, it is conceived that those who were non-smokers would eventually try shisha smoking and became users as their friends.[29] Other studies have further shown that shisha smokers were significantly more likely to have shisha-smoking friends.[30]

This study has shown that the status of income or pocket money, among other factors, contributed to the habit of shisha smoking (p=0.040) as shown in Table 5. Students with more income were more likely to smoke shisha than those with less income. This finding matched the study that showed that adolescents with more pocket expenditures were more susceptible to smoking initiation.[22] Another study by Joveyni and colleagues reported a similar relationship between income and smoking.[27] Peers often viewed shisha smoking as a practice for the well to do families. Students from well to do families have higher chances of smoking tobacco in shisha.

The respondents expressed many reasons that enticed them to smoking shisha. Some of the reasons given were that smoking shisha reduces stress and was one way to enjoying leisure. These reasons for smoking shisha were statistically significant, and compatible with reasons documented by Tyas and his colleagues indicating that youths smoked shisha as a way of having fun, getting rid of sadness, passing leisure time, having a new experience and as a way of creating social relationships.[19]

Perception of the participants on harmfulness of shisha mmoking to one's health

Some of the respondents (79.6%) in this study perceived shisha smoking as harmless or without health risk (Table 5). The results further indicated a negative association, which entailed that students who perceived shisha smoking as safe, without risk to health were more likely to engage in the practice than those who foresaw associated health risk. These findings match a number of previous studies.[1,26,28] In reality, shisha smoking is just as dangerous as cigarette smoking.[29]

Other studies have further reported that 89% of the participants who smoked shisha perceived it as harmfuless.[4,8] In addition, a study from Egypt revealed that 74% of the student participants perceived shisha smoking as less harmful than cigarette smoking.[25]

There seems to be a misconception that shisha smoking is safer than cigarette smoking, perhaps because the invention of shisha smoking involves the passage of smoke through water that is presumed to filter the smoke and remove toxic agents.[26,27] However, it was found that shisha smoking could be as deadly as cigarette smoking.[2] Some authors have reported some beliefs that falsely suggested that tobacco contained "healthy" fruits beneficial for health.[26,28] However, according to Oluwafemi, the amount of shisha smoke inhaled exceeded that of one cigarette smoke by 200 times.[16]

The hypotheses on demographic factors, religion, accessibility, social factors and personal factors have been rejected for age, peer pressure, monthly income, and the personal factors and accepted for gender, type of family, religion and accessibility. Additionally, all the factors, namely; age of the smoker, type of religion, shisha smoking and perceived risk that were significant at univariate analysis were again statistically significant at multivariate analysis. The participants whose friends smoked shisha were four times more likely to smoke shisha than participants whose friends do not smoke shisha (OR=4.417, CI=1.760-11.086).

CONCLUSION

The study shows that there is misconception about the safety of tobacco smoked through shisha compared to tobacco smoked in cigarette. This data will help policy makers to consider employing campaigns and preventive measures directed at cigarette smoking to shisha smoking as well, such as putting warning signs on all packages of shisha on the harmful effects of tobacco. Furthermore, research should be intensified and use this data as starting point for a regular surveillance system on shisha smoking practices and development of an effective peer based prevention programmes.

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