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Factors Influencing Shisha Smoking Among Students in Tertiary Institutions in Kisumu County, Kenya

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ABSTRACT

The use of tobacco products poses a significant public health challenge, affecting approximately 1.1 billion smokers and is expected to rise. In Kenya, 37% of university students in Nairobi County were engaging in Shisha smoking. Despite the growing prevalence of Shisha smoking among the youth, studies specifically focusing on reasons for its use in Kenya remain limited. This study aimed to establish individual factors influencing Shisha smoking among students in tertiary institutions in Kisumu County. The study used a cross-sectional study design. The target population was 26,384 students aged 18 - 24 years. The sample size obtained was 398 students, which was computed based on a known prevalence of 37%. The study targeted tertiary institutions: Maseno University, Uzima University College, Great Lakes University of Kisumu, Kenya Medical Training College-Kisumu, and Kisumu National Polytechnic. Institutions were purposely sampled, and each sample was determined using population proportionate to size, stratified sampling was employed to obtain students across all academic years and simple random sampling was used to achieve the sample size. The reliability of the questionnaires was assessed using a Cronbach's Alpha with a score of more than 0.7 for all the objectives, and data collection was conducted by trained research assistants using pre-tested questionnaires. Data analysis was conducted using SPSS version 25. Frequencies and percentages were used to determine the prevalence and reasons for Shisha smoking. Cramer's V and Chi-square p-value <0.05 were used to establish associations. Curiosity (26.6%), pleasure-seeking (21.8%) and the appeal of flavours (19.4%) of the students led them to smoke shisha. There was no significant association between self-esteem and shisha smoking (p-value 0.407). The study concludes that curiosity and social factors: as the appealing and stylish nature of flavoured Shisha were identified to be the motivators for tobacco smoking among the students the study recommends that there should be social and behavioural change communication strategies for promoting healthy Shisha, conducting support groups and working with parents in sensitisation of education initiatives on Shisha smoking.

Keywords: Curiosity, Flavoured Tobacco, Pleasure-Seeking, Shisha Smoking, Stress Relief

I. INTRODUCTION

Globally, Shisha smoking has become popular with the youth because it is socially acceptable and the such being trendy as opposed to cigarettes (Maziak *et al*., 2015). Many youths start Shisha smoking in order to fit into a particular group or be accepted into a gathering (Cornacchione *et al*., 2016). There has been an assumption that water acts as a filter and hence removes the harmful smoke unlike cigarettes even though studies have revealed that it is as dangerous or even more dangerous (Hyland *et al*., 2017). Also, curiosity, stress, ease and promotions of Shisha smoking on social media platforms are some of the reasons why the use of social media is gradually increasing all over the globe (Monshi, 2021). Shisha smoking among students is primarily a result of social acceptance and peer pressure (Gathuru *et al*., 2015; Martinasek *et al*., 2017). It is further self-reinforced by tastes and appeal to cultural narration, particularly among Middle East students and the social interaction created by shared smoking sessions in campus shisha cafes (Wong *et al*., 2016; Abdulrashid *et al*., 2018).

Shisha smoking is on the rise even in African countries and a higher prevalence rate has been recorded in Uganda 36.4% and Rwanda 20.8% respectively (Aanyu *et al*. 2019). Flavoured tobacco products are easily found on the market and because the youths believe shisha is much healthier than actually smoking, the vice has become popular among the youths. Moreover, Sweetened and flavoured tobacco (Shisha) has enhanced its appeal, particularly among youthful users in sub-Saharan Africa (Aanyu *et al*. 2019; Kabuya & Mulwa, 2024; Oboma & Ben, 2024). Most of the youths lack

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adequate knowledge about the heinous health consequences that are linked to Shisha smoking which makes it a popular choice (Othman *et al*., 2019). Moreover, a lack of or weak policies and low enforcement of policies that cheque the smoking of tobacco products makes the smoking of Shisha possible, especially in social places where the act is perceived as trendy (Patil, 2020).

Shisha smoking is most commonly practised in Kenya among university students where in Nairobi City it was established to be at 37% (Kinga, 2018) and the youths in urban Mombasa and Nairobi recorded the use of Shisha at 14.3% and 14 % respectively (Kinga, 2018; Kahuthia-Gathu *et al*, 2013). The culture of initiation, especially in tertiary institutions and among the youthful persons between the ages of 14 and 25 years, is due to the mistaken belief that it is less hazardous than cigarette smoking (Government of Kenya [GoK], 2017). It also highly influences people's gender and age and the highest rates are observed in young men between the ages of 18 and 24 (Wambui *et al*., 2018). Despite having prohibited the smoking of Shisha in 2017, laxity in the policing of the law and cultural appreciation for the practice still see Shisha smoking predominantly among youths in Kenya's urban areas (Government of Kenya, 2017). This study endeavoured to understand the individual factors that could be supporting Shisha smoking among tertiary students in Kisumu County, Kenya.

1.1 Statement of the Problem

Students are willing to smoke shisha due to its acceptance by society, pressure from friends, and think it is safe due to flavoured tobacco alongside weak policy on shisha smoking (Maziak *et al*., 2015; Aanyu *et al*., 2019; Patil, 2020). Despite the Kenyan government ban in 2017, there has been continuous usage of Shisha among the urban youth between 14% to 37% (Kahuthia-Gathu *et al*., 2013; Kinga, 2018). Moreover, studies are scarce with emphasis on the cognitive and behavioural determinants of shisha smoking (Wambui *et al*., 2018). This study thus relied on Social Cognitive Learning Theory to establish the individual factors associated with shisha smoking among students in tertiary institutions in Kisumu County. This study aimed to establish the individual factors such as appealing nature, self-esteem and knowledge level impacting Shisha smoking among the students. However, to ensure an effective ban on shisha smoking there was the need to understand individual factors that keep this trend relentless, especially in Kisumu County, Kenya where bans have been put in place (Kinga, 2018; Kahuthia-Gathu *et al*., 2013; Government of Kenya, 2017). The study sought to address significant knowledge gaps and provide evidence-based insights for targeted intervention strategies in a context where weak policy enforcement, cultural acceptance and flavoured tobacco continue to normalize this potentially harmful practice among young adults aged 18-24 (Government of Kenya, 2017; Omotehinwa *et al*., 2018).

1.2 Research Objectives

To establish the individual factors influencing *Shisha* smoking among youth in tertiary institutions in Kisumu County

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Social Cognitive Learning Theory

The Social Cognitive Learning Theory is applied in this study to focus on individual factors of Shisha smoking. The most important is observational learning as the people imitate what they see in their friends, families, or somewhere else, which strengthens the belief that Shisha smoking is normal and cool (Danaei *et al*., 2017; Villanti *et al*., 2019). Interest and the desire for flavoured tobacco products are derived from social observations and perceived influence from media models who depict smoking as a fun and risk-free exercise (Akl *et al*., 2015). Besides, extrinsic reinforcements such as stress relief, self-esteem boost or social approval encourage people who start the habit and continue it where the risks of Shisha smoking are underappreciated (Rahimi-Movaghar & Sadeghizadeh, 2016).

In Africa, the theory is manifested in the relations between internal and extraneous factors. Usually, young people emulate other individuals engaging in the practice within various social situations, which cognitively rationalises the compulsive shisha-smoking habits as simple stress-relief mechanisms, as was evidenced in Cameroon and Rwandan studies (Ngahane *et al*., 2023; Omotehinwa *et al*., 2018). The verbal instructional model is also in practice, either through encouragement for Shisha use by communication and persuasion or integration into the culture (Fakhrashrafi, 2020). Ignorance of health risks increases this behaviour because students consider it as less perilous than cigarette smoking, another aspect that was supported by Bandura in terms of cognitive elements that define behaviour (Kanmodi *et al*., 2019).

The Kenyan cases indicate that Factors related to the individual including perception and knowledge of the effect of Shisha strongly support the theory. Observational learning is evident since consumers in urban geographical locations such as Nairobi and Mombasa mimic the behaviours observed among students (Kinga, 2018; Kahuthia-Gathu *et al*., 2013). Its continual use is thus attributed to intrinsic reinforcement like perceived other benefits like stress

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relieving or fun despite university students not knowing the risks involved in smoking (Rahimi-Movaghar & Sadeghizadeh, 2016). These cognitive and behavioural factors as explained in detail in Bandura's framework help explain why Kenyan youths are taking to Shisha smoking.

2.2 Empirical Review

Some of the factors behind shisha smoking include Flavored and trendy tobacco products, and precisely university students patronising the commodity. Innovations that include flavoured maassel have escalated Shisha smoking, especially among the youths in search of novelty, pleasure or relief from stress (Danaei *et al*, 2017; Villanti *et al*., 2019). This activity is exacerbated by stress relief, and high self-esteem, as users indicate that smoking makes them feel more relieved or cultured. Previous cigarette smoking data is strongly associated with Shisha use with research revealing high co-occurrence of both behaviours among the Syrian & Florida university students.

Flavours are still one of the main reasons for Shisha use in Nigeria and Cameroon, where 68% of the participants reported that they use flavoured Shisha (Fakhrashrafi, 2020; Ngahane *et al*., 2023). Other than taste and scent, curiosity prompts many youths towards the use of Shisha, 59% of Cameroon students and 51% of Rwandan respectively explored Shisha due to curiosity (Ngahane *et al*., 2023; Omotehinwa *et al*., 2018). Some consider Shisha smoking, for instance, among Pakistani college students, as a way of seeking perceived pleasure. However, misconceptions relating to Shisha and its safety continue to entice recreational users due to the perception that water filtration has the effect of purging dangerous substances.

Health risk awareness of Shisha users is at a very low level. A significant number of students also consider Shisha to be less dangerous than cigarettes, because water removes tobacco poisons (Joveini *et al*., 2016). Research has nevertheless found that Shisha smoking increases carbon monoxide exposure as well as nicotine and smoke toxins similar to deadly cigarettes (World Health Organization, 2014). There are health hazards associated with waterpipe smoking in other parts of the world (Kanmodi *et al*., 2019).

In Kenya prevalence of Shisha use is high, especially among university students where 37% of students in Nairobi have used Shisha (Kinga, 2018). However, although it was banned in 2017, Shisha is still widely used because of its flavoured types stylish appearance and reputation, and is listed among the most used substances in many cities, including Nairobi and Mombasa (Kahuthia-Gathu *et al* 2013; Kinga, 2018). Students in Kisumu also have similar attractions to Shisha citing curiosity, stress and related misconceptions regarding its harm.

III. METHODOLOGY

This study used a descriptive cross-sectional design to establish the individual factors influencing *Shisha* smoking among youth in tertiary institutions in Kisumu County. The design flexibility was the main reason it was used to assess the variables determining the prevalence of shisha usage among youths in Kisumu County. The study area was in Kisumu County with a focus on tertiary institutions. The target population comprised the students in selected tertiary institutions located within Kisumu County in their first year to fourth year of study. Tertiary institutions observed were Maseno University, Kenya Medical Training Institute- Kisumu, Kisumu National Polytechnic, Uzia University College and Great Lakes University of Kisumu.

The target population of the students in tertiary universities was 26,384. Stratified sampling was used to draw a sample size of 398 using Cochran's formula (Cochran, 1977). Whose data was obtained using a structured questionnaire.

$$n = \left(\frac{z^2 p(1-p)}{e^2}\right)$$

$$n = \frac{1.96^2(0.37)(1-0.37)}{0.05^2} n = \frac{0.89547}{0.0025}$$

$$n = 358\ Students$$

The researcher computed a 10% attrition rate to cater for the non-response.

$$Attrition\ rate = \frac{358\ Students}{1-0.1} = 398 \text{ students}$$

$$ni = 398\ Students$$

Data was entered into the computer with the aid of the Statistical Package for Social Sciences (SPSS Version 25). Data was further cleaned for completeness and analysed descriptively (frequency and percentage tables) and inferentially (Chi-Square and Cramer's V test). However, from the cleaned analysed data, only 124 students said that they were current or previous shisha smokers. This study only analysed students with a history (current or previous) of shisha smoking. The findings were presented in tables.

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Ethical clearance was obtained from Maseno University Ethics and Research Committee and a research permit from the National Commission of Science, Technology and Innovation. The integrity and privacy of the participants and the data were maintained by the researcher.

IV. FINDINGS & DISCUSSION

4.1 Individual Factors to Shisha Smoking

This study sought to examine some selected individual factors that could have contributed to shisha smoking by the students. The findings on *shisha* smoking factors show that curiosity is the most popular cause, accounting for 26.6% (33 out of 124) of respondents. Pleasure-seeking is followed by 21.8% (27 people), and the enticing character of *Shisha* flavours inspires 19.4% (24 people). Other prominent causes are stress alleviation at 10.5% (13 people) and academic challenges at 9.7% (12 people). A lesser proportion, 8.1% (10 people), smoke *Shisha* to better their social standing, whereas 4.0% (5 people) have no stated purpose. These data indicate that curiosity, enjoyment, and flavour appeal are important motivators for *Shisha* use. Table 1 presents the findings.

Table 1

Individual Factors of Shisha Smoking by Students

Individual factors of *Shisha* smoking	**Frequency (n)**	**Percent (%)**
Curiosity	33	26.6
Improves status	10	8.1
Pleasure seeking	27	21.8
Relieves stress	13	10.5
Problem with studies	12	9.7
Shisha flavours are appealing	24	19.4
No reason	5	4.0
Total	**124**	**100.0**

The researcher further computed a chi-square to determine the crosstabulation between drivers of *Shisha* smoking and the frequency (days) of *Shisha* smoking in a month. Table 2 illustrates the findings.

Table 2

Individual Factors of Shisha Smoking and Frequency (days) of Shisha Smoking in a Month

		Days smoked *Shisha* in the past month			**Total**
		1 - 3 days	**4 - 6 days**	**7 days and above**	
Individual factors of *Shisha* smoking	Curiosity	28	5	0	33
	Improves status	9	1	0	10
	Pleasure seeking	21	4	2	27
	Relieves stress	10	2	1	13
	Problem with studies	9	1	2	12
	Shisha flavours are appealing	16	6	2	24
	No reason	5	0	0	5
Total		**98**	**19**	**7**	**124**

Table 2 shows that *Shisha* smoking behaviour over the past month among 124 respondents reveals that curiosity is the leading driver of *Shisha* use, where 33 (26.6%) students, were smoking *Shisha* due to curiosity. Further, it was revealed that 28 students who were smoking *Shisha*, smoked for 1-3 days, and only 5 students smoked 4 – 6 days a month. Pleasure-seeking is the second most cited reason, accounting for 27 respondents (21.8%), where 21 smoked 1 – 3 days, 4 smoked 4 – 6 days and 2 smoked 7 or more days in a month. The appeal of *Shisha* flavours also significantly influenced the usage, accounting for 24 students (19.4%), where 16 smoked 1 – 3 days, 6 smoked 4 – 6 days and 2 smoked 7 or more days in a month. Stress relief and academic challenges were less prevalent reasons, accounting for 13 (10.5% - 10 for 1 – 3 days, 2 for 4 – 6 days and 1 for 7 or more days in a month) and 12 (9.7% - 9 for 1 – 3 days, 1 for 4 – 6 days and 2 for 7 or more days in a month). Finally, it was revealed that 10 students (8.1% - 9 for 1 – 3 days and 1 for 4 – 6 days in a month) smoked to improve their social status, while 5 had no specific reason associated with 1 – 3 days in a month. Overall, most students smoked *Shisha* occasionally (1-3 days), which indicated that *Shisha* usage might be driven more by social or situational factors rather than habitual dependence. Table 3 shows the chi-square and Cramer's V test results.

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Table 3

Drivers of Shisha Smoking and Frequency (days) of Shisha Smoking in a Month

Chi-Square Tests			
	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	27.932[a]	24	0.263
Likelihood Ratio	29.677	24	0.196
Linear-by-Linear Association	.641	1	0.423
N of Valid Cases	123		
a. 26 cells (74.3%) have an expected count of less than 5. The minimum expected count is .41.			
Symmetric Measures			
		Value	**Approximate Significance**
Nominal by Nominal	Phi	.477	0.263
	Cramer's V	.238	0.263
N of Valid Cases		123	

The Chi-square and Cramer's V tests were used to investigate the relationship between the factors that influence *Shisha* smoking and the frequency of smoking in a month ($V = 0.238$, $df = 24$, $\chi = 27.932$, $p = 0.263$). The Pearson Chi-Square with a p-value of 0.263, suggests that there was no statistically significant relationship between the drivers' smoking frequency ($p > 0.05$). The Cramer's V value of 0.238 indicated a modest relationship between the variables.

4.1.1 Appealing and Stylish Nature as Factors of Shisha Smoking

Table 4 the appealing nature of *Shisha* that attracts youths to smoke was further analysed. The social atmosphere accounted for 21.0% (26) and the desire to fit with friends accounted for 20.2% (25) which emerged as the most common appeal. The taste of *Shisha* also played a significant role accounting for 19.4% (24). It was also reported that the smell of *Shisha* accounted for 15.3% (19) and the perception that *Shisha* was safer than cigarettes accounted for 11.3% (14). Fewer individuals were drawn by the looks of *Shisha* about 8.1% (10). Finally, it was revealed that 4.8% (6) of the students smoked provided no reason towards their appeal to smoking *Shisha*.

Table 4

Appealing and Stylish Nature of Shisha Smoking

Appeal	**Frequency (n)**	**Percent (%)**
Taste	24	19.4
Smell	19	15.3
Looks good	10	8.1
Social atmosphere	26	21.0
Safer than cigarette	14	11.3
To fit in with my friends	25	20.2
No reason	6	4.8
Total	**124**	**100.0**

The researcher sought to cross-tabulate the appealing and stylish nature of *Shisha* smoking among students and the frequency of *Shisha* smoking in a month. Table 5 presents the association between appeal and frequency of *Shisha* smoking.

Table 5

Crosstabulation Between Appealing Nature of Shisha Smoking

		Days smoked *Shisha* in the past month			
		1 - 3 days	**4 - 6 days**	**7 days and above**	**Total**
Appeal for *Shisha* smoking	Taste	19	5	0	24
	Smell	17	1	1	19
	Looks good	9	1	0	10
	Social atmosphere	20	5	1	26
	Safer than cigarette	8	3	3	14
	To fit in with my friends	19	4	2	25
	No reason	6	0	0	6
Total		**98**	**19**	**7**	**124**

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Table 5 shows that the social atmosphere was the most significant driver, with 26 participants (21%) smoking *Shisha*, where 20 students smoked for 1- 3 days, 5 smoked for 4 – 6 days and 1 smoked for 7 or more days in a month. The taste of *Shisha* was also highly influential in order to fit in with friends where 19 smoked 1 – 3 days and 5 smoked 4 – 6 days in a month. Similarly, 25 respondents (20.2%) smoked to fit in with friends, where 19 smoked 1 – 3 days, 4 smoked 4 – 6 days and 2 smoked 7 or more days in a month. The smell of *Shisha* attracted 19 participants (15.3%), where 17 smoked 1 – 3 days, 1 smoked 4 – 6 days and 1 smoked 7 or more days in a month. An attribute of *Shisha* smoking as safer than cigarettes influenced 14 students (11.3% - 8 smoked 1 – 3 days, 3 smoked 4 – 6 days and 3 smoked 7 or more days in a month), and the aesthetic appeal of *Shisha* – looking good was associated with 10 students (8.1% - 9 smoked 1 – 3 days and 1 smoked 4 – 6 days in a month). Notably, 6 students (4.8%) cited no specific reason for smoking *Shisha*. Table VI presents the coefficient analysis.

Table 6

Appealing Nature of Shisha and Current Shisha Smoking

Chi-Square Tests			
	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	29.376[a]	24	.206
Likelihood Ratio	29.201	24	.213
Linear-by-Linear Association	5.892	1	.015
N of Valid Cases	123		
a. 27 cells (77.1%) have an expected count of less than 5. The minimum expected count is .49.			
Symmetric Measures			
		Value	**Approximate Significance**
Nominal by Nominal	Phi	.489	.206
	Cramer's V	.244	.206
N of Valid Cases		123	

Table 6 shows that Chi-square tests were used for the coefficient analysis, which investigated the relationship between the appeal of *Shisha* and the frequency of *Shisha* smoking at the moment ($V = 0.244$, $df = 24$, $\chi = 29.376$, $p = 0.206$). There was no statistically significant correlation between the appealing aspects of *Shisha* and smoking frequency ($p > 0.05$), according to p p-value of 0.206. Moreover, there appears to be little correlation between these variables, as indicated by the Cramer's V value of 0.244.

4.1.2 Cigarette Smoking as a Predisposing Factor to *Shisha* Smoking

The question of whether the students were currently smoking cigarettes or had ever smoked cigarettes was used to determine the association with *shisha* smoking. This focused on the entire sample size. The finding in Table 7 shows the frequency of the current and the ever-cigarette smokers.

Table 7

Current and Past Cigarette Smokers among Students

		Smoked shisha		
		Smoked	**Never smoked**	**Total**
Current cigarette Smoking	Yes	40	5	45
	No	84	219	303
Total		**124**	**224**	**348**

Table 7 shows that Among students who have smoked shisha, 40 (88.9%) were current cigarette smokers, whereas 5 (11.1%) have never smoked cigarettes. Moreover, among students who had never smoked shisha, 84 (27.7%) were current cigarette smokers, while 219 (72.3%) had never smoked cigarettes.

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Table 8

Association between Cigarette Smoking and Shisha Smoking

Chi-Square Tests					
	Value	**df**	**Asymptotic Significance (2-sided)**	**Exact Sig. (2-sided)**	**Exact Sig. (1-sided)**
Pearson Chi-Square	80.564[a]	1	.000		
Continuity Correction[b]	77.536	1	.000		
Likelihood Ratio	73.521	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	80.375	1	.000		
N of Valid Cases	348				
a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 13.65.					
b. Computed only for a 2x2 table					
Symmetric Measures					
			Value	**Approximate Significance**	
Nominal by Nominal	Phi		.434	.000	
	Cramer's V		.434	.000	
N of Valid Cases			348		

Table 8 shows that the chi-square analysis provided substantial evidence of a statistically significant association between shisha smoking and cigarette smoking status as the moderate effect size of Cramer's V test suggested that students who smoked shisha were more likely to also be current cigarette smokers compared to those who did not engage in shisha smoking ($V = 0.434$, $\chi = 80.564$, $df = 1$, $p < .001$).

Table 9

Past Cigarette Smokers among Students

		Smoked shisha		
		Smoked	**Never smoked**	**Total**
Ever Smoked Cigarette Previously	Yes	48	21	69
	No	76	203	279
Total		**124**	**224**	**348**

Table 9 shows that among students who had smoked shisha, 48 (69.6%) have previously smoked cigarettes, while 21 (30.4%) have never smoked cigarettes. Also, of students who had never smoked shisha, 76 (27.2%) had previously smoked cigarettes, whereas 203 (72.8%) had never smoked cigarettes.

Table 10

Association between Past Cigarette Smoking and Shisha Smoking

Chi-Square Tests					
	Value	**df**	**Asymptotic Significance (2-sided)**	**Exact Sig. (2-sided)**	**Exact Sig. (1-sided)**
Pearson Chi-Square	50.545[a]	1	.000		
Continuity Correction[b]	48.592	1	.000		
Likelihood Ratio	46.247	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	50.426	1	.000		
N of Valid Cases	348				
a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 22.36.					
b. Computed only for a 2x2 table					
Symmetric Measures					
			Value	**Approximate Significance**	
Nominal by Nominal	Phi		.344	.000	
	Cramer's V		.344	.000	
N of Valid Cases			348		

Table 10 shows that the chi-square analysis revealed a significant association between shisha smoking and having smoked cigarettes in the past and that the moderate effect size suggested that students who had smoked shisha

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were more likely to have previously smoked cigarettes than those who had never smoked shisha ($V = 0.344$, $\chi = 50.545$, $df = 1$, $p < .001$).

4.1.3 Self-Esteem of the Students with *Shisha* Smoking

The study endeavoured on the self-esteem of the students with a *Shisha* smoking history as shown in Table XI. Self-esteem was measured based on the Four-point Likert scale on agreement level and was further converted into categorical data focusing on agree and disagree only. A majority (80.6%) reported being satisfied with themselves, while 19.4% disagreed. However, 47.6% indicated that they sometimes thought they were not good at all and 54.5% expressed feeling that they did not have much to be proud of after using *Shisha*. Despite these negative sentiments, 79.8% of the students believed they possessed good qualities and 73.4% felt capable of performing tasks as well as others. Furthermore, 75.6% felt they were individuals of worth, although 51.6% admitted to feeling useless at times. 59.0% of students reported an inclination to feel like failures and 35.5% expressed a desire for greater self-respect. In general, 80.5% of the group upheld a positive attitude towards themselves.

Table 11

Self-esteem among Students from Tertiary Institutions in Kisumu County

Self-esteem	**Disagree**		**Agree**	
Overall, I am satisfied with myself	100	80.6%	24	19.4%
A times I think am not good at all	65	52.4%	59	47.6%
I think I have a number of good qualities	99	79.8%	25	20.2%
I can do things as well as most other people	91	73.4%	33	26.6%
I feel I do not have much to be proud of	56	45.5%	67	54.5%
I certainly feel useless at times	60	48.4%	64	51.6%
I feel I am a person of worth at least on an equal plane with others	93	75.6%	30	24.4%
I wish I could have more respect for myself	80	64.5%	44	35.5%
All in all, I am inclined to feel that am a failure	50	41.0%	72	59.0%
I take a positive attitude towards myself	99	80.5%	24	19.5%

The researcher computed a crosstabulation to assess the association between self-esteem and the frequency of *Shisha* smoking in the month. Table 12 shows the cross-tabulation of the findings between the lowering of self-esteem of the students and *current Shisha* smokers.

Table 12

Crosstabulation between Composite Self-Esteem and Current Shisha Smoking

		Days smoked *Shisha* in the past month			
		1 - 3 days	**4 - 6 days**	**7 days and above**	**Total**
The composite effect of self-esteem	Disagree	81	18	6	105
	Agree	17	1	1	19
Total		**98**	**19**	**7**	**124**

Table 12 shows that the majority (105, 84.7%) of the students with a history of *Shisha* smoking disagreed that self-esteem influenced their smoking behaviour. Of the 105 students disagreeing said that 81 individuals smoked for 1–3 days, 18 for 4 - 6 days and 6 for 7 or more days. Conversely, only 19 (15.3%) students agreed that self-esteem played a role in their smoking, where 17 smoked for 1 - 3 days, 1 smoked for 4 – 6 days and 1 smoked for 7 or more days in a month. These findings suggest that for most participants, *Shisha* smoking is not strongly linked to issues of self-esteem, and the behaviour may instead be driven by other factors such as social influences or personal preferences. Table XIII shows the chi-square and Cramer's V test on the association of the findings.

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Table 13

Chi-Square and Cramer's V test between Composite Self-Esteem and Current Shisha Smoking

Chi-Square Tests			
	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	1.797[a]	2	0.407
Likelihood Ratio	2.209	2	0.331
Linear-by-Linear Association	0.846	1	0.358
N of Valid Cases	124		
a. 2 cells (33.3%) have an expected count of less than 5. The minimum expected count is 1.07.			
Symmetric Measures			
		Value	**Approximate Significance**
Nominal by Nominal	Phi	0.120	0.407
	Cramer's V	0.120	0.407
N of Valid Cases		124	

The Chi-Square test and Cramer's V findings in Table 13 reveal no significant relationship between self-esteem and *Shisha* smoking behaviour among the 124 respondents ($V = 0.120$, $df = 2$, $\chi = 1.797$, $p = 0.407$). The Pearson Chi-Square score is 1.797 with a p-value of 0.407, implying that any changes in smoking behaviour depending on self-esteem are most likely attributable to chance. Cramer's V value of 0.120 indicates a small association between self-esteem and *Shisha* use. Overall, self-esteem had no significant impact on *Shisha* smoking in this population.

4.1.4 Knowledge of the Health Effects of *Shisha* Smoking

The researcher sought to establish the health concerns of smoking *Shisha*. Table 14 illustrates respondents' understanding of the health effects of *Shisha* smoking. Most respondents (63.9%) disagreed that smoke from a *Shisha* pipe contained dangerous compounds such as tar, while 36.1% agreed. Similarly, 54.0% denied that *Shisha* smoke contained dangerous compounds such as carbon monoxide, whereas 46.0% agreed. There was a balance of opinion (50.0% agreeing and 50.0% disapproving) on the idea that the water in a *Shisha* pipe filters out tobacco toxins. When questioned about particular health hazards, 54.5% denied that *Shisha* smoking caused cancer, whereas 45.5% agreed. Furthermore, 62.1% disputed that *Shisha* smoking raises the risk of cardiovascular disease, whereas 37.9% agreed. The findings indicate that there is a considerable lack of understanding or misconceptions about the severe health effects of *Shisha* smoking among students. The findings are summarised in Table 14.

Table 14

Knowledge of Health Effects of Shisha Smoking

Health concerns about *Shisha* smoking	**Disagree**		**Agree**	
Smoke inhaled from *Shisha* pipes contains harmful chemicals such as tar	78	63.9%	44	36.1%
Smoke inhaled from *Shisha* pipes contains harmful chemicals such as carbon monoxide	67	54.0%	57	46.0%
Tobacco toxins are filtered out by the water in the *Shisha* pipe	62	50.0%	62	50.0%
Shisha smoking causes cancers	67	54.5%	56	45.5%
Shisha smoking causes increased risks of cardiovascular diseases	77	62.1%	47	37.9%

Table 15 shows that 77 (62.1%) disagreed that there were health concerns attributed to *Shisha* smoking and 47 (39.9%) agreed that *Shisha* smoking had health concerns. Of the 77 students (62.1%) who disagreed with health concerns associated with *Shisha* smoking, 60 (77.9%) smoked for 1 - 3 days, 13 (16.9%) smoked for 4 - 6 days, and 4 (5.2%) smoked for 7 or more days. In contrast, of the 47 students (37.9%) who agreed with health concerns, 38 (80.9%) smoked for 1 - 3 days, 6 (12.8%) smoked for 4 - 6 days, and 3 (6.4%) smoked for 7 or more days. Despite awareness of health risks, a substantial proportion (80.9%) of those concerned still smoked for 1 - 3 days, indicating that knowledge of the health effects may not significantly deter *Shisha* smoking behaviour. Table 15 presents a summary of cross-tabulation between health concerns drawn from *Shisha* smoking by students.

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Table 15

Test of Association between Knowledge of Health Effects of Shisha Smoking and Frequency of Shisha Smoking in a Month

		Days smoked *Shisha* in the past month			
		1 - 3 days	**4 - 6 days**	**7 days and above**	**Total**
Health concerns	Disagree	60	13	4	77
	Agree	38	6	3	47
Total		**98**	**19**	**7**	**124**

4.1.5 Knowledge Level on the Health Effects of *Shisha* Smoking

The study investigated the knowledge level of the students regarding *Shisha* smoking. Table 16 is illustrated as follows.

Table 16

Knowledge and Health Effects of Smoking Shisha by Students in Kisumu County

Knowledge and health effects	**Disagree**		**Agree**	
Smoking *Shisha* helps one relax	66	53.2%	58	46.8%
Smoking *Shisha* helps people stay together	57	46.0%	67	54.0%
One gets less nicotine from *Shisha* smoking	50	40.3%	74	59.7%
The *Shisha* smoking is as addictive as cigarettes	66	54.1%	56	45.9%
Occasional cigarette smoking is more dangerous than smoking *Shisha*	61	49.6%	62	50.4%
The dangers of smoking *Shisha* are exaggerated	56	45.2%	68	54.8%
Sharing the *Shisha* pipe is not harmful	59	47.6%	65	52.4%
Shisha pipe smokers become more addicted as they smoke	78	64.5%	43	35.5%
Each inhalation of *Shisha* smoking affects the body	76	61.3%	48	38.7%
Shisha pipe smoking takes years off the smoker's body	62	50.4%	61	49.6%
Shisha smokers can quit easily	64	52.5%	58	47.5%

Table 16 showed that 66 (53.2%) of the students disagreed that *Shisha* smoking helped them relax, while 58 (46.8%) agreed. It was said that 67 (54.0%) students felt that *Shisha* helped people stay together, while 57 (46.0%) disagreed. Furthermore, 74 (59.7%) of students agreed that *Shisha* has less nicotine than cigarettes, while 50 (40.3%) disagreed. Furthermore, 67 (54.1%) thought *Shisha* was as addictive as cigarettes, while 57 (45.9%) disagreed. Opinions on the hazards of occasional cigarette smoking vs *Shisha* were almost evenly distributed, with 50.4% believing that occasional *Shisha* smokes were riskier than *Shisha*. Furthermore, 68 (54.8%) stated that the risks of *Shisha* smoking were overblown, whilst 56 (52.4%) said that sharing a *Shisha* pipe was harmless. The study also found that 80 (64.5%) agreed that *Shisha* users grow more hooked the longer they smoke, while 76 (61.3%) acknowledged that each inhalation affected the body. Finally, students were evenly divided on whether *Shisha* reduces the smoker's life expectancy (50.4% disagreed, 49.6% agreed) and if *Shisha* smokers can easily quit (52.5% disagreed and 47.5% agreed).

The researcher computed a cross-tabulation to establish an association between the knowledge level of health effects of *Shisha* smoking. The chi-square test of independence was used to determine this. Table 17 presents cross-tabulation findings.

Table 17

Crosstabulation between Knowledge Level of the Health Effect of Shisha and Frequency of Shisha Smoking in a Month

		Days smoked *Shisha* in the past month			
		1 - 3 days	**4 - 6 days**	**7 days and above**	**Total**
Knowledge level of the health effect	Disagree	52	12	4	68
	Agree	46	7	3	56
Total		**98**	**19**	**7**	**124**

Table 17 showed that 68 (54.8%) disagreed with knowing the level of health effects of *Shisha* smoking while 56 (45.2%) agreed. Of the 68 students (54.8%) who disagreed about the health effects, 52 (76.5%) smoked for 1 - 3 days, while 12 (17.6%) smoked for 4 - 6 days and 4 (5.9%) smoked for 7 or more days in a month. Among the 56 students (45.2%) who agreed with the knowledge of the health effects of *Shisha* smoking, 46 (82.1%) smoked for 1 - 3 days, 7 (12.5%) for 4 - 6 days and 3 (5.4%) for 7 days or more in a month.

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4.2 Discussion

4.2.1 Individual Factors of Students into *Shisha* Smoking

The research shows that curiosity, desire and flavoured Shisha seem to be some of the main reasons that lead students to use Shisha. Curiosity, which was considered more often, at 26.6%, corresponds to trends in Shisha use around the world, where young adults are fascinated by the newness of Shisha and the image that accompanies it (Omotehinwa *et al*., 2018). Pleasure-seeking, which accounted for 21.8% of students, also appeared frequently as students associated Shisha smoking with relaxation and enjoyment in social settings. This was a trend also observed among university students in the Middle East and Africa (Danaei *et al*., 2017). The influence of Shisha flavours, which was reported by 19.4% of students, further emphasised how the diverse, sweetened options make Shisha attractive. This finding is corroborated by Villanti *et al*. (2019), who reported that flavour appeal was a significant factor for young people, especially those who perceive Shisha as safer than cigarettes.

Other factors such as stress relief (10.5%) and academic challenges (9.7%) indicated that some students may turn to Shisha as a coping mechanism, a behaviour also documented in studies in Nigeria and Pakistan, where university students cited stress easing as a reason for Shisha use (Ngahane *et al*., 2023). Social motives though not as much in prevalence as the previous types supported the decision in 8.1% of respondents citing social status improvement as their reason. This was the image-related aspect of Shisha use reported among Kenyan youths in Nairobi and other regions where Shisha social acceptability affects use (Kinga, 2018). The findings pointed out the need to identify the determinants of Shisha use. This meant that there was a need to come up with better intervention efforts that would have an appeal to discourage Shisha smoking while at the same time, correcting any knowledge gaps with regard to it.

4.2.2 Appealing and Stylish Nature of *Shisha*

The study revealed that 21.0% of the respondents smoked Shisha due to the social atmosphere of the activity and another 20.2% due to fit in with friends. This supported previous conclusions that Shisha use was highly correlated with socialization. Other studies revealed that Shisha was normalized in social contexts where the construction of its use was proffered as a group activity among young adults (Omotehinwa *et al*., 2018; Cornacchione *et al*., 2016). Furthermore, the taste (19.4%) and scent (15.3%) of Shisha came out strongly in the attraction area a study showed that flavoured tobacco products were particularly appealing to young people making Shisha seem more pleasurable and less dangerous than cigarettes (Villanti *et al*., 2019). This misconception of Shisha being safer than cigarettes is indicated by 11.3 % of the students. These results supported the other previous research whereby learners had a wrong impression about Shisha and underestimated the health risks associated with it due to filtration by water (Kinga, 2018; Joveini *et al*., 2016). Lastly, 8.1% claimed to have been influenced by the aesthetic nature of Shisha and 4.8% of the respondents could not explain why they were influenced in any way.

4.2.3 Self-Esteem among Students with a Previous History of *Shisha* Smoking

It was revealed that 80.6% of the students had general self-esteem, 47.6% had sometimes felt low self-esteem, 54. 5% had no pride after using Shisha. This meant that there was a relationship between smoking and unfavourable self-esteem. Still, the majority of the students (79.8%,) reported they had good qualities in them and 73.4% of the students reported they were competent in their academic tasks or job – though, 51.6% of the students sometimes felt incompetent and 59.0% of the students sometimes felt like failures. These mixed feelings are well supported by other studies for which Shisha use has been contemporarily associated with concerns about self-esteem due to pressure or stress (Ngahane *et al*., 2023; Omotehinwa *et al*., 2018). In addition, 35.5% of the respondents reported a lack of self-respect, reinforcing the connection between Shisha use and self-worth.

This study therefore reveals that the majority (84.7%) of the Shisha smokers among the students admitting past use of the drug did not smoke due to self-esteem regardless of the frequency of their Shisha smoking. This suggested that social or personal factors may play a larger role. Just 15.3% of respondents believed that self-esteem affected behaviour. Using chi-square and Cramer's V test, it can be concluded that self-esteem and Shisha smoking are independent variables. This low level of association as depicted by a Cramer's V of 0.120 means that self-esteem could not be considered as a determinant of Shisha use among these students. This backed up the conclusion that students' smoking behaviours might be aligned more with certain social factors or personal choices rather than issues to do with self-esteem. Some researchers have also found that Shisha smoking is socially motivated, and young people partake in Shisha smoking due to social pressure, flavoured smoke, and the culture that is associated with Shisha when used socially (Omotehinwa *et al*., 2018; Villanti *et al*., 2019).

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4.2.4 Knowledge of the Health Effects of *Shisha* Smoking

The findings of this study showed that there exist major knowledge deficits in students about the hazards of Shisha smoking which they perceived to be healthy. More than half of the students (63.9%) disagreed that Shisha smoke contained harmful compounds like tar and 54.0% rejected the presence of carbon monoxide even though research shows that Shisha smoke has a high level of tar and carbon monoxide (Hyland *et al*., 2017). Additionally, perceptions of Shisha's effects were mixed: while 53.2% disagreed that Shisha helped them relax, 46.8% found it calming, reflecting Shisha's perceived social and relaxing appeal. Notably, over half (54%) of students believed Shisha promoted social bonding, echoing findings that underscored its popularity in group settings (Omotehinwa *et al*., 2018). Together, these findings pointed to Shisha's social appeal amid significant misunderstandings about its health risks among students.

The study reveals mixed perceptions among students regarding Shisha's effects and risks, showing both awareness and misconceptions. While 53.2% of students disagreed that Shisha smoking helps them relax, a substantial 46.8% believed it does, underscoring Shisha's social appeal and perceived calming effects. More than half of the students (54.0%) believed Shisha satisfied social bonding, which was consistent with other studies that Shisha is enjoyed more in a social context than for personal leisure (Omotehinwa *et al*., 2018). On the topic of nicotine content, students were still misled with 59.7% of them believing that Shisha has lower nicotine content than cigarettes. This is even when most research proves that Shisha exposes its users to equal or higher levels of nicotine and such can lead to dependency (Cornacchione *et al*., 2016). However, 54.1% agreed that Shisha is addictive; 64.5% identified that the use of Shisha leads to increased dependency (Aanyu *et al*., 2019).

For instance, 54.8% considered that health risks associated with waterpipe use are exaggerated and 52.4% believed that using a waterpipe is safe, which are paradigmatic misconceptions due to underestimation of the risks posed by shared use of waterpipe. Finally, views and perceptions regarding the effects of Shisha on life expectancy and ability to quit were mixed and therefore imply the need to enhance the educational campaigns to change the allure of Shisha smoking as well as to publicize the various negative impacts of the same practice.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

The study established that curiosity and social relations significantly influenced Shisha smoking among students in tertiary institutions in regards to the flavoured Shisha used frequently appealed to the students. While reasons for change in smoking frequency may have been easily identifiable in the initial stages, posted estimates indicated that few of these influences had close links to altered smoking behaviour and it would again seem that person or societal settings influenced behaviours over time. Most importantly, self-esteem appeared to influence smoking habits very slightly, implying that extrinsic variables overruled intrinsic variables.

5.2 Recommendations

Analysing the cause of curiosity that leads students to some smoking behaviours, and developing programs that can offer alternatives will help curb Shisha use among students. The formation of discussion groups that would target students wishing to stop using Shisha would help in addressing the self-organisational mechanisms implicit in this behaviour. Political actions should be strengthened by incorporating parents and guardians in the educational sessions so that they gain knowledge on the causes of students smoking and, be in a position, to follow best practices in supporting those actions.

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