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Prevalence of tobacco use and awareness of effects on oral health among secondary school students in Dar es Salaam, Tanzania

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Abstract

Background: Tobacco used in various forms has been shown to start as a habit at a young age and is linked to adverse effects on oral health. Those not aware of the negative consequences of tobacco use on oral tissues have been reported to have a higher probability of smoking.

Aim: To determine the prevalence of tobacco, use and awareness of its effects on oral health among secondary school students in Dar-es-salaam, Tanzania.

Methods: This descriptive cross-sectional study was conducted among students from 9 secondary schools in Dar-es-Salaam, Tanzania. A proportionate stratified random sampling was used, and 1084 students were sampled. Each sampled student was provided with a pre-tested self-administered questionnaire about information on the prevalence of use of tobacco, different forms of smoking ever used and awareness of the effects of tobacco use on oral health. Data analysis generated frequency distributions and cross-tabulations using SPSS version 23. The level of statistical significance was set at $p<0.05$.

Results: Of the 1084 sampled students, only 1067 dully filled in the questionnaire, giving a response rate of 98.4%. The age range was 13-26 (M =16, SD =1.6) years. The majority of the students were 16-19 years old (59.3%), and the proportion of boys to girls was 1:1. Many more of the students were from public-owned schools (71.8%) and peri-urban areas (66.2%). The prevalence of those currently using tobacco products was less than 1% and contributed to by those smoking cigarettes (0.7%), using tobacco snuff (0.6%) or chewing tobacco (0.4%). The proportion of students reported to have ever used any form of tobacco was 65 (6.1%), with many more having ever smoked cigarettes 46 (4.3%) than those who ever dipped tobacco snuff 28 (2.6%) or ever used chewed tobacco 16 (1.5%). More than three-quarters of the students were aware that tobacco used in any form was related to the occurrence of oral cancer and periodontal diseases.

Conclusions: The prevalence of tobacco use among secondary school children in Dar-es-Salaam is low (<1%) and more so among male students but not determined by type or location of school. The proportion of students who had ever used any form of tobacco was less than ten per cent (6.1%), and many more who smoked cigarettes (4.3%) than other products. The high level of awareness of students on the effects of tobacco use on the occurrence of oral cancer and periodontal diseases can be considered a deterrent to tobacco use and a reduced risk of nicotine dependency among secondary school students.

Keywords: Prevalence, awareness, oral health, tobacco, smoking cigarettes, tobacco snuff, secondary school students, oral cancer, periodontal diseases, Tanzania

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Introduction

Tobacco use is a habit that has been shown to start at a young age. (Kelishadi et al., 2016) (Grapatsas et al., 2017)(Kwamanga et al., 2003) and results in dependence on nicotine early in life (Jasinska et al., 2014). Furthermore, its use is a public health concern linked to adverse oral and general health effects. (Komar et al., 2018).

It has been documented that tobacco use globally has declined over two decades since 2000, and its use has been projected to decrease from 2010 to 2030 by 21% among males and 40% among females. (World Health Organization, 2022)Despite this decline, regional variations are noted where its use is increasing, as reported among school-going children in East Africa. (Tezera & Endalamaw, 2019). According to the most recent Global Youth Tobacco Survey, 4.8 percent of students 13-15 years old were current tobacco users, with a higher prevalence among boys (6.5 percent) than girls (2.4 percent) (United Republic of Tanzania, 2016).

Studies previously conducted in Tanzania on tobacco use mainly report on the prevalence of cigarette smoking. (Kapito-Tembo et al., 2011) with a few reports on smokeless tobacco, of which snuff and chewed tobacco are said to be the commonest (Kaduri et al., 2008), (Mnyika et al., 2007). Tobacco use, regardless of its different forms, is known to be a risk factor for oral diseases like oral cancer and periodontal disease; most surveys do not comprehensively reflect estimates on the types of tobacco used. (Hanioka et al., 2011)(Amtha et al., 2014)(Gajendra et al., 2023).

Awareness among adolescents that tobacco consumption can adversely affect their oral health has been reported to have a lower probability of smoking than those who were not aware of the negative consequences of tobacco use on oral tissues. (Nazir & Almas, 2017)(Lawal & Fagbule, 2020). Previous studies in Tanzania (Carneiro et al., 2011), (Kaaya et al., 1992), reported that most students who smoked were aware of cigarette smoking as a cause of oral cancer. However, there was scanty information on the level of awareness among students on the effects of tobacco use and the occurrence of periodontal diseases.

The prevalence and level of awareness of tobacco use and the effects of different forms on oral health among adolescents in Tanzania are scanty. This study was undertaken to determine the prevalence and level of awareness of the impact of tobacco use on the occurrence of oral cancer and periodontal diseases among secondary school students in Dar-es-Salaam, Tanzania. Ascertaining the prevalence of tobacco use and the level of awareness among secondary school students will allow for appropriate preventive intervention against early nicotine dependence.

Methods

Study design and setting of the study:

This cross-sectional descriptive study was conducted among secondary school students in Dar-es-Salaam, Tanzania. The city was purposefully selected because of its dense population and heterogeneous culture. (The United Republic of Tanzania, 2022). The sample size was determined using the sample size determination formula for proportions ($n=z^2p(1-p)/\varepsilon^2$, where n= sample size; z = standardized deviation (z =1.96) for 95% confidence interval; p = proportion of adolescent smokers in Tanzania (p=6.0%) (Kaduri et al., 2008); ε= marginal error = 0.02. To take care of the dilution effect due to stratification, the determined sample size was doubled to 1084.

To obtain the required sample, students were selected based on the stratification of schools by location (urban/peri-urban), type of school (public/private), and size of school (90 to 2000 students per school). To avoid the influence of school size, only 73 medium-sized secondary schools with 500-1000 students were included in the sampling frame: 27 schools from urban (20

public and seven private schools into which 291 and 101 students) and 46 schools from peri-urban (33 public and 13 private schools out of which 487 and 195 students) location were respectively selected. Each school study randomly chose participants using table numbers from each form 1-3 student's alphabetic class attendance lists.

Data collection

Selected students were seated in one classroom, and following obtaining consent, instructions on filling out the self-administered questionnaires were provided. The questionnaire had three sections; the first section obtained socio-demographic details about age in years, sex, location of school and type of school. The second section obtained information from subjects regarding whether they were currently using tobacco and the type of product used. Students were also asked about having ever used tobacco products and the type of tobacco product used. Questions about the kind of tobacco product used were designed to inquire if a student had ever chewed tobacco, used tobacco snuff, or smoked cigarettes.

For each type of tobacco product used, responses to each option were five: a) I have never used tobacco snuff; b) I have tried a little but never really used tobacco snuff; c) I used tobacco snuff, but now I have stopped; d) I do not use tobacco snuff every day but every week; and e) I use tobacco snuff every day. Similar responses were also used to determine smoking cigarettes. For each type of tobacco product, responses of students were categorized as having never used any form of tobacco = 0 if they responded 'no' to I have never used tobacco snuff, chewed tobacco, or smoked cigarettes while those who answered 'yes' to option 2 – 4 were regarded as having ever used any form of tobacco = 1.

The third section of the questionnaire obtained information on the awareness of tobacco use on oral health. For each type of tobacco product (chewed tobacco, tobacco snuff, or cigarette smoking), awareness of the effects on oral health caused by its use was determined for oral cancer and periodontal disease. Awareness of the use of tobacco snuff as a cause of oral cancer/periodontal disease was assessed by two question statements: '*People who use tobacco snuff are more likely to develop oral cancer/periodontal disease than non-tobacco snuff users',* and *'A person who has used tobacco snuff for many years is more likely to develop oral cancer/periodontal disease than a person who has used for a short duration*. The same question statements were used to assess respondent's awareness of the effects of chewing tobacco and cigarette smoking on oral health. A score of two points was assigned to the correct response to each of the first question statements and three points to the correct response to the second question statement. This gave a maximum score of 5 points, which denotes excellent knowledge, and a minimum score of zero, denoting a complete lack of awareness. A respondent was regarded as having adequate awareness if scored 5.0 points, moderately aware if scored 2.0 - 3.0 points, and not aware if the score was less than 2.0. The same question statements, computation of scores, and grading of respondent's awareness were done for chewing tobacco and cigarette smoking, respectively. For cross tabulation, moderately and fully aware were recoded into having awareness.

Data entry and analysis

Data was entered into the computer using SPSS version 23. Data analysis included frequency distribution and cross-tabulation between current use of tobacco and types, ever using tobacco and types, level of awareness on oral health effects of tobacco use, and socio-demographic variables, which were age (13-15 years =0 and 16-26 years =1; based on mean age of 16 years), sex

(male=0 and female =1), location of school (urban=0 and peri urban=1) and type of school (public=0 and private=1). The chi-square test was used to determine the level of statistical significance at a p-value of <0.05.

Ethical considerations

The Muhimbili University ethical committee approved the study with Ref.No.MU/PGS/SAEV/Vol. IV/263. Each Municipal Secondary Education Officer and head teacher of the school was permitted to conduct the survey of secondary school students. The students gave informed consent, and after the questionnaires were filled out, a half-hour session was used to raise students' awareness of the harmful effects caused by tobacco use.

Results

One thousand and sixty-seven out of 1084 sampled students handed in filled questionnaires, constituting a response rate of 98.4%. The study participants were 13-26 years old, with a mean of 16 years (SD=1.4). The distribution of studied secondary school students by socio-demographic variables shows that most students were aged 16-26 years (n=642; 60.2%) with an equal proportion of boys and girls of 1:1. Many of the participants (n=766; 71.8%) were from public owned schools and peri-urban locations (n=706; 66.2%).

The prevalence of those currently using tobacco was very low (n=8;0.7%) and contributed to by (0.7%) smoking cigarettes, using tobacco snuff (0.6%), and chewing tobacco (0.4%). The proportion of students who have ever used any form of tobacco was below ten percent (n=65; 6.1%), with many more having ever smoked cigarettes 46 (4.3%), in comparison to those who ever chewed tobacco 16 (1.5%) and ever used tobacco snuff 28 (2.6%) (Table 1).

Table 1. Percentage distribution of students who are currently using and who have ever used tobacco (N=1067).

Status of tobacco use	Number (%)
Currently using tobacco (smoke cigarette/dip tobacco snuff)	
Yes	8(0.7)
No	1059(99.3)
Currently smoking cigarettes	
Yes	6(0.6)
No	1061(99.4)
Currently dipping tobacco snuff	
Yes	6(0.6)
No	1061(99.4)
Currently chewing tobacco	
Yes	4(0.4)
No	1063(99.6)
Ever used tobacco (smoke cigarette/chew/dip tobacco snuff)	
Yes	65(6.1)
No	1002 (93.9)
Ever smoked cigarettes	
Yes	46(4.3)
No	1021(95.7)
Ever dipped tobacco snuff in the oral cavity	
Yes	28(2.6)
No	1039(97.4)

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Ever chewed tobacco	
Yes	16(1.5)
No	1051(98.5)

Table 2 shows the percentage distribution of students who are currently using and who have used tobacco by socio-demographic variables**.** Compared to girl students, boys were more current users of tobacco products ($p<0.05$). Students currently using tobacco products were those from public schools, unlike no students in private schools.

Compared to female students, statistically, significantly more boys reported to have ever used tobacco products ($p<0.001$), and many more reported to have ever smoked cigarettes ($p<0.001$) than other tobacco products. Proportionately, more students studying in schools located in peri-urban schools reported to have ever used tobacco products than their counterparts from urban schools ($p<0.05$). Proportionately, more students studying in public schools reported to have ever used any tobacco products, smoked cigarettes and dipped tobacco snuff, but the difference was not statistically significant.

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Table 2. Percentage distribution of students who are currently using and who have ever used tobacco by socio-demographic variables (N=1067).

Variable	Currently using tobacco products		Ever used tobacco products		Ever smoked cigarettes		Ever chewed tobacco		Ever used tobacco snuff		Total n (%)
	Yes n (%)	No n (%)	Yes n (%)	No n (%)	Yes n (%)	No n (%)	Yes n (%)	No n (%)	Yes n (%)	No n (%)	
Age (Years)											
13 – 15	5(0.5)	420(40.3)	21 (2.0)	404 (37.9)	15 (1.4)	410 (38.4)	7 (0.7)	418 (39.2)	11 (1.0)	414 (38.8)	425 (39.8)
16 – 26	3(0.3)	615(59.0)	44 (4.1)	598 (56.0)	31 (2.9)	611 (57.3)	9 (0.8)	633 (59.3)	17 (1.6)	625 (58.6)	642 (60.2)
Sex											
Male	7(0.7)*	525(49.2)	47 (4.4)***	485 (45.5)	33 (3.1)**	499 (46.8)	11 (1.0)	521 (48.8)	19 (1.8)	513 (48.1)	532 (49.9)
Female	1(0.1)	534(50.1)	18 (1.7)	517 (48.5)	13 (1.2)	522 (48.9)	5 (0.5)	530 (49.7)	9 (0.9)	526 (49.3)	535 (50.1)
Location of school											
Urban	3(0.3)	358(33.6)	25 (2.3)	336 (31.5)	16 (1.5)	345 (32.3)	8 (0.7)	353 (33.1)	14 (1.3)	347 (32.5)	361 (33.8)
Peri Urban	5(0.5)	701(65.7)	40 (3.7)	666 (62.4)	30 (2.8)	676 (63.4)	8 (0.7)	698 (65.4)	14 (1.3)	692 (64.9)	706 (66.2)
Type of School											
Public	8(0.7)	758(71.0)	46(4.3)	720(67.5)	32(3.0)	734(68.8)	13(1.2)	753(70.6)	22(2.1)	744(69.7)	766(71.8)
Private	0	301(28.2)	19(1.8)	282(26.4)	14(1.3)	287(26.9)	3(0.3)	298(27.9)	6(0.6)	295(27.6)	301(28.2)

*Chi-squared test: * = p<0.05; ** = p<0.001; *** =p<0.0001*

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Table 3 presents the proportion of students by their level of awareness of the effects of smoking cigarettes on oral health. Overall, 88.1% and 89.7% of respondents were aware of smoking cigarettes as a cause of oral cancer and periodontal diseases, respectively. Proportionately, there was a statistically significant difference in awareness for students residing in the peri-urban areas when compared to their counterparts from urban areas ($p<0.05$). All students reported to have ever smoked were aware of the effects of cigarette smoking on oral health. There was a difference in proportion in the level of awareness of cigarette smoking as a cause of oral cancer and periodontal diseases with regard to sex, age, and type of school, but the difference was not statistically significant.

Table 3: Proportion of student's level of awareness on effects of smoking cigarettes on oral health by socio-demographic variables and (N=1067)

Variables	Causes Oral cancer		Causes periodontal diseases		Total
	Knowledgeable n=940 (88.1%)	Not knowledgeable n=127 (11.9%)	Knowledgeable n=957 (89.7%)	Not knowledgeable n=110 (10.3%)	n (%)
Age (Years)					
13-15	376(35.2)	49(4.6)	383(35.9)	42(3.9)	425(39.8)
16-26	564(52.9)	78(7.3)	574(53.8)	68(6.4)	642(60.2)
Sex					
Male	464(43.5)	68(6.4)	481(45.1)	51(4.8)	532(49.9)
Female	476(44.6)	59(5.5)	476(44.6)	59(5.5)	535(50.1)
Location of school					
Urban	307(28.8)	54(5.1)	315(29.5)	46(4.3)	361(33.8)
Peri Urban	633(63.4)*	73(6.8)	642(60.2)	64(6.0)	706(66.2)
Type of school					
Public	266(24.9)	35(3.3)	686(64.3)	80(7.5)	766(71.8)
Private	674(63.2)	92(8.6)	271(25.4)	30(2.8)	301(28.2)
Currently smoking cigarettes					
Yes	5(0.5)	1(0.1)	4(0.4)	2(0.2)	6(0.6)
No	935(87.6)	126(11.8)	953(89.3)	108(10.1)	1061(99.4)
Ever smoked cigarettes					
Yes	42(3.9)	4(0.4)	38(3.6)	8(0.7)	46(4.3)
No	898(84.2)	123(11.3)	919(86.1)	102(9.2)	1021(95.7)

*Chi-squared test: * = $p<0.05$; ** = $p<0.001$; *** = $p<0.0001$*

Presented in Table 4 is the proportion of students by their level of awareness of the effects of chewing tobacco on oral health. Overall, 93.5% and 90.6% of respondents were aware of chewing tobacco as a cause of oral cancer and periodontal diseases, respectively. Proportionately, there was a statistically significantly higher awareness for students residing in the peri-urban areas when compared to

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their counterparts from urban areas (p<0.05). Almost all students who reported chewing tobacco or having ever chewed tobacco were aware of the effects of chewing tobacco on oral health. There was no statistically significant difference between the proportion of the level of awareness of chewing tobacco as a cause of oral cancer and periodontal diseases with regards to sex, age and type of school.

Table 4: Proportion of students aware of the effects of chewing tobacco on oral health by socio-demographic variables (N=1067).

Variables	Causes Oral cancer		Causes periodontal diseases		Total n (%)
	Knowledgeable N=998 (93.5%)	Not knowledgeable N=69 (6.5%)	Knowledgeable N =967(90.6%)	Not knowledgeable N=100 (9.4%)	
Age (Years)					
13-15	400(37.5)	25(2.3)	389(36.5)	36(3.4)	425(39.8)
16-26	598(56.0)	44(4.1)	578(54.2)	64(6.0)	642(60.2)
Sex					
Male	502(47.0)	30(2.8)	488(45.7)	44(4.1)	532(49.9)
Female	496(46.5)	39(3.7)	479(44.9)	56(5.2)	535(50.1)
Location of school					
Urban	332(31.1)	29(2.7)	323(30.3)	38(3.6)	361(33.8)
Peri Urban	666(62.4)*	40(3.7)	644(60.4)	62(5.8)	706(66.2)
Type of school					
Public	716(67.1)	50(4.7)	695(65.1)	71(6.7)	766(71.8)
Private	282(26.4)	19(1.8)	272(25.5)	29(2.7)	301(28.2)
Currently chewing tobacco					
Yes	3(0.3)	1(0.1)	4(0.4)	0	4(0.4)
No	995(93.3)	68(6.4)	963(90.3)	100(9.4)	1063(99.6)
Ever chewed tobacco					
Yes	43(4.1)	0	14(1.3)	2(0.2)	16(1.5)
No	942(90.3)	58(5.6)	953(89.3)	98(9.2)	1051(98.5)

*Chi-squared test: * = p<0.05; ** = p<0.001; *** =p<0.0001*

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Presented in Table 5 is the proportion of students by level of awareness on the effects of dipping tobacco snuff on oral health. Ninety-one-point-one percent and 90.8% of students were aware of dipping tobacco snuff as a cause of periodontal diseases and oral cancer, respectively. The majority of students reported having ever used tobacco snuff and were mindful of its effects on oral health, but the difference was not statistically different. Proportionately, there was a difference in the level of awareness regarding sex, age, location of school, and type of school. However, the difference was not statistically significant.

Table 5: Proportion of students aware of the effects of using tobacco snuff on oral health by socio-demographic variables (N=1067).

Variables	Causes Oral cancer		Causes periodontal diseases		Total n (%)
	Knowledgeable	Not knowledgeable	Knowledgeable	Not knowledgeable	
Age (Years)					
13-15	391(36.6)	34(3.2)	393(36.8)	32(3.0)	425(39.8)
16-26	578(54.2)	64(6.0)	579(54.3)	63(5.9)	642(60.2)
Sex					
Male	488 (45.7)	44 (4.1)	489(45.8)	43(4.0)	532(49.9)
Female	481 (44.6)	54 (5.1)	483(45.3)	52(4.9)	535(50.1)
Location of school					
Urban	324(30.4)	37(3.5)	321(30.1)	40(3.7)	361(33.8)
Peri Urban	645(60.4)	61(5.7)	651(61.0)	55(5.2)	706(66.2)
Type of school					
Public	695(65.1)	71(6.7)	697(65.3)	69(6.5)	766(71.8)
Private	274(25.7)	27(2.5)	275(25.8)	26(2.4)	301(28.2)
Currently using tobacco snuff					
Yes	1(0.1)	5(0.5)	1(0.1)	5(0.5)	6(0.6)
No	97(9.1)	964(90.3)	94(8.8)	967(90.6)	1061(99.4)
Ever used tobacco snuff					
Yes	27(2.5) 942(88.3)	1(0.1)	25(2.3)	3(0.3)	28(2.6)
No		97(9.1)	947(88.8)	92(8.5)	1039(97.4)

*Chi-squared test: * = p<0.05; ** = p<0.001; *** =p<0.0001*

Discussion

It is envisaged that good habits developed at a young age continue throughout adulthood; however, shaping the behavior and habits of secondary school students poses a challenge to most communities, including Tanzania. Determining the Prevalence of tobacco use and awareness of its effects on oral health among secondary school students in Dar-es-Salaam, Tanzania, provides baseline information on the magnitude of this habit. This study provides insight into the use of tobacco and its products among secondary school children and allows for the prediction of nicotine dependency. Generalizations from this study should be made with caution, considering that not all children of this age group are enrolled in secondary schools. Furthermore, responses to the questionnaire may have been underreported since tobacco products are prohibited at schools

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(The United Republic of Tanzania, 2003). The sampling procedure considered the demographic variables that have been shown to influence tobacco use, namely, sex, type, and school location. The authors believe this is a methodological strength of the present study. Furthermore, this study assessed the commonly used tobacco products in the country, namely, cigarettes, chewing tobacco, and tobacco snuff, and may have unintentionally omitted other tobacco products in the market.

The low prevalence of current users of tobacco (<1%) found in this study was in disagreement with findings from the 5th Tanzania National Oral Health Survey (The United Republic of Tanzania, 2020) that reported a 3% prevalence of tobacco use by participants. An even higher prevalence of student tobacco users of 11%, 11.8%, and 17.5% was reported in Noida, India (Narain et al., 2011), Valencia, Spain (Ribera-Osca et al., 2023) and Kampala, Uganda (Mpabulungi & Muula, 2004) respectively. This difference in the prevalence of tobacco use among students could be a valid finding; however, fear of reporting the use of tobacco as a student may have contributed to the low prevalence (The United Republic of Tanzania, 2003).

In this study, the low proportion of students reported to have ever used any form of tobacco or specifically ever smoked cigarettes, dipped tobacco snuff, or chewed tobacco was similar to findings previously reported by (Kaduri et al., 2008) and contrast to findings from a study conducted in secondary schools in Temeke District, Dar-es-Salaam (Kida et al., 2010) that reported a higher prevalence of tobacco use, 23% and 16% for boys and girls. The difference in prevalence could be related to the type of instrument used to obtain information about the use of tobacco and have ever used any form of smoking.

The proportions of students who have ever smoked cigarettes (4.1%) and those who are currently smoking cigarettes (0.6%) indicate that smoking cigarettes, in comparison to other forms of tobacco, is practiced more by secondary school students. These findings were similar to other studies done in Tanzania (Kaduri et al., 2008), (United Republic of Tanzania, 2022) and Iran (Kelishadi et al., 2016). Contrastingly, the reported prevalence of ever-smoked cigarettes among secondary school students was higher (14.3%) in Dodoma city (Simbee, 2012) and in Uganda (Kadobera et al., 2016) and other Sub-Saharan African countries (Agaku et al., 2014), (Sreeramareddy et al., 2014). Furthermore, unlike findings from this study where a small number of students who had ever smoked cigarettes continued to smoke cigarettes, a study in Valencia, Spain, reported that of those who ever smoked cigarettes, 38(12.4%), a relatively high number, 36(11.8%) were current smokers of cigarettes (Ribera-Osca et al., 2023). Prohibition of the use of tobacco products in schools may explain the low prevalence (The United Republic of Tanzania, 2003)However, being readily available and having pocket money could encourage the use of tobacco (Kapito-Tembo et al., 2011).

The prevalence of students who ever used and are current users of tobacco snuff reported in the current study is similar to that previously reported in Dar es Salaam (Kaaya et al., 1992), Moshi (Mnyika et al., 2007) and in some Sub-Saharan countries (Sreeramareddy et al., 2014). In disagreement, a much higher prevalence of dipping tobacco snuff has been reported in Sudan (El-Amin et al., 2011), Rwanda (Agaku et al., 2014) and Uganda (Kadobera et al., 2016). The low prevalence of tobacco snuff might be attributed to snuff not being readily available when compared to cigarettes.

A similar pattern in gender preference for using tobacco snuff was reported in Sub-Saharan Africa (Sreeramareddy et al., 2014) was also observed in this study. In disagreement, studies in Moshi, Tanzania (3.0% and 0.5%) (Mnyika et al., 2007) and students in South Africa (8.4% and 3.9%)

(Peltzer, 2003), reported more female than male young adults to have used tobacco snuff. The ease of using tobacco snuff probably explains why women prefer it to other forms of tobacco.

The prevalence of students who ever smoked cigarettes, chewed tobacco or dipped tobacco snuff should not be ignored as these students are likely to influence others to use tobacco products (Kwamanga et al., 2003), thereby having an increased risk of about two times of developing oral cancer (Amtha et al., 2014) and periodontal disease (Hanioka et al., 2011). Therefore, interventions against this habit at an early age are essential to prevent nicotine dependence and reduce the potential of influencing others to start smoking and the risk of acquiring oral cancer and periodontal disease (Jasinska et al., 2014).

More than ninety percent were aware of the relationship between cigarette smoking, chewing tobacco, dipping tobacco snuff, and the occurrence of oral cancer. This indicates that the majority of respondents in the present study had an adequate level of awareness that smoking cigarettes, chewing tobacco, and using tobacco snuff causes oral cancer. The findings of the current study are similar to those reported by researchers in Japan (Hanioka et al., 2011), Nigeria (Ehizele et al., 2011), Uganda (Aanyu et al., 2019) and India (Bassi et al., 2021), where the proportion of respondents who were aware of the effects caused by tobacco use on oral health varied from 72.3% to 99.8%. The results of the present study are higher when compared to studies reported in Sri Lanka (Ariyawardana & Vithanaarachchi, 2005) and India (Paul et al., 2014). Having an awareness of the effects of tobacco on oral health may not necessitate its nonuse, considering most adolescents are eager to experiment with different habits.

The proportion of students reported to be aware of the relationship between tobacco use and the occurrence of periodontal diseases in the present study is much higher than those reported in the Kingdom of Saudi Arabia (11.3%) (Shetty, 2015) and in Nigeria (2.2%) (Nwhator et al., 2010). This indicates that the majority of secondary school students were aware of tobacco use as a cause of periodontal diseases. Besides having an awareness of the relationship between tobacco use and the occurrence of periodontal disease, other factors like societal and peer pressure may influence the initiation and continued use of tobacco (Kwamanga et al., 2003)

However, being aware may not deter a student from trying or experimenting with substance abuse products such as tobacco. It has been reported that a school with strong measures on drug use has statistically significantly a lower number of drug user (Evans-Whipp et al., 2007)We need to enforce the law and continue to educate not only students but also parents and teachers on the harmful effects of tobacco on health. This will ensure that all parents and teachers become active participants in the campaigns against tobacco use.

Conclusions

The prevalence of current tobacco use among secondary school children in Dar-es-Salaam is low (<1%) and more so among male students but not determined by type or location of school. The proportion of students who had ever used any form of tobacco was less than ten percent (6.1%), and many more who smoked cigarettes (4.3%) than other products. The high level of awareness of students on the effects of tobacco use on the occurrence of oral cancer and periodontal diseases can be considered a deterrent to tobacco use and a reduced risk of nicotine dependency among secondary school students.

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