

Prevalence, Perceived Factors and Knowledge on Hazards of Tobacco Chewing Among Secondary School Students in Jeddah City 2013-2014

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Abstract: Smokeless tobacco is a tobacco or a tobacco product that is used by means other than smoking, it is available as loose leaves, plugs (bricks), or twists of rope. A piece of tobacco placed behind the lower lip, sometimes next to cheek at either side of mouth. It is either chewed or held in place.

Objectives: To determine the prevalence, perceived factors that may lead and deter secondary school students to use tobacco and knowledge on hazards of tobacco chewing on health among secondary school students in jeddah city (2014).

Materials and methods: This was a descriptive cross-sectional study conducted among secondary schools in jeddah city. A sample of 530 students from 10 schools were selected using stratified random sampling procedure. Selected students were requested to fill in an Arabic version of pre-tested questionnaire. Data analysis was done using SPSS version 19 and Chi-square test was used to measure the association between independent and dependent variables. The level of statistical significance was set at $p < 0.05$.

Results: The prevalence of tobacco chewing among secondary school students in jeddah city was 28.7%. Majority of students (61.7%, 64%) were respectively highly knowledgeable on relationship between tobacco chewing and occurrence of oral cancer and periodontal diseases. 'Influence of friends' was the most common factor that influence students to start chewing tobacco by (66.5%). "Good guidance from parents and guardians' 'Knowing detrimental health effects caused by tobacco chewing' and 'Religious teachings' were perceived as factors that may inhibit a person to start chewing tobacco. The tobacco smoking was significantly higher among students who chew tobacco compared with the ones who don't [(25% & 2.9%, $P = 0.00$) and (30.3 % & 4.5 %, $P = 0.00$) respectively].

Conclusions: The prevalence of tobacco chewing among secondary school students in jeddah city appear to be high. Majority of students who participated in this study had good level of knowledge on the detrimental effects of tobacco chewing on health. 'Influence of friends' was the most common factor that influence students to start chewing tobacco. Finally, There was a significant association between tobacco chewing and tobacco smoking.

Recommendations: There is need for intervention among secondary school students to prevent possible continued trend of tobacco chewing. There should be a call for religious leaders, parents, school teachers to be involved in discouraging chewing of tobacco among secondary school students. Health education should be directed to raise awareness regarding detrimental effects of tobacco chewing among secondary school students.

Keywords: Tobacco, Smokeless tobacco, Prevalence, Addiction, Secondary school.

I. INTRODUCTION

These uses include chewing, sniffing, placing the product between the teeth and gum, or application to the skin, it is available as loose leaves, plugs (bricks), or twists of rope. A piece of tobacco placed behind the lower lip, sometimes next to cheek at either side of mouth.⁽¹⁾

Different types of smokeless tobacco are consumed throughout the world. In the United States, the main types of smokeless tobacco are chewing tobacco (cut tobacco leaves) and snuff (moist ground tobacco). In Sweden, "snus" (finely ground moist tobacco) is used. In India as well as in Saudi Arabia, smokeless tobacco contains tobacco leaf mixed with other ingredients, such as areca nut and lime.⁽²⁾

The tobacco plant is thought to be originated in the mainland between North and South America probably dates back at least 5000 years. In 1499, Amerigo Vespucci found an Indians on margarita Island, off the coast of Venezuela, who chewed a green herb known as tobacco. The Europeans introduced tobacco into South Asia in the 1600s, for pipe smoking and probably also as snuff and chewing.^(3,4)

Since 1970, smokeless, or spit, tobacco has gone from a product used primarily by older men to one used predominantly by young men and boys. This trend has occurred as smokeless tobacco promotions have increased dramatically and a new generation of smokeless tobacco products has hit the market. Smokeless tobacco use increases the risk of developing many health problems. Furthermore, evidence shows that adolescent boys who use smokeless tobacco products have a higher risk of becoming cigarette smokers within four years.⁽⁵⁾

Tobacco chewing is prevalent in all parts of the world and all age groups, though it varies in extent. The pattern of use varies across the globe, with relatively higher prevalence in the South Asian region (India, Pakistan, Bangladesh, China and Thailand), United States of America and Brazil. An estimate of the number of tobacco chewing globally is 600 million. Smokeless tobacco users in India and Pakistan together have been estimated to number 100 million. In 2006, 8 million (3.3 percent) of Americans over age 12 were current smokeless tobacco users.^(6,7)

In whichever the form it is used, tobacco releases nicotine, which is a stimulant that increases activity in the brain just like caffeine, cocaine and amphetamine. The stimulant effect of nicotine to the brain creates the desire for a person to continue using tobacco until one becomes addicted therefore being exposed to harmful effects of other chemicals present in tobacco. Smokeless tobacco causes oral, esophageal, and pancreatic cancers and may also cause heart disease, gum disease, and oral lesions other than cancer, such as leukoplakia, bad breath and cavities.⁽⁸⁻¹⁰⁾

Smokeless tobacco is easier to hide and use than smoke products, especially in the restricted environment of schools. Tobacco use among peer groups, friends, siblings and parents is a powerful influence for initiation of various forms of tobacco use in adolescence. Furthermore, daily smokeless tobacco users were more likely to start using cigarettes, and alcohol than others.⁽¹¹⁾

Because smokeless tobacco products have not received the same adverse publicity as smoking tobacco, despite being equally life threatening, and because there is no adequate studies regarding Tobacco chewing among adolescent in Jeddah city as well as the urgency to assess the depth of such problem among adolescent and to find the appropriate preventive measures that help to prevent or decrease this bad habit, we did our study. We also wanted to see if there is any association between tobacco chewing and other bad habits among adolescent in Jeddah city, and to know the level of awareness among these young youths about the risks of tobacco chewing and what triggered them to practice this unhealthy habit.

II. OBJECTIVES

A. General objective:

To determine the prevalence, perceived factors that may lead and deter secondary school students to use smokeless tobacco and the knowledge about hazards of tobacco chewing on health among secondary school students in Jeddah city (2014).

B. Specific objectives:

1. To determine prevalence of tobacco chewing among secondary school students in Jeddah city.
2. To determine level of knowledge of the effects of tobacco chewing on health (especially the oral health) among secondary school students in Jeddah city.

3. To determine perceived factors that are influencing the secondary school students in Jeddah city to initiate chewing tobacco.
4. To identify the association between tobacco chewing and tobacco smoking among secondary school students in Jeddah city.
5. To identify perceived factors that inhibit the secondary school students in Jeddah city from chewing tobacco.

III. METHODOLOGY

A. Study design, area and time:

Descriptive cross-sectional study was conducted in jeddah city (the most populated city in makkah province) during the period of 10/11/2013 - 30/3/2014.

B. Study population:

The study population were students who joined the secondary schools registered in education office in Jeddah city during the study period.

Jeddah city have 104 male general public secondary schools, 10 of these schools were selected randomly and were involved in our study. A list of all students in these secondary schools was obtained from Ministry of Education (Statistic & Planning Department).

C. Sample size estimation:

Calculation of sample size is based on the following formulae⁽¹²⁾:

$$N = \frac{z^2(pq)}{d^2}$$

N= sample size required.

Z= confidence level, (for 95% z= 1.96).

(p= 13%) according the study in the same character of population in USA 2011.⁽¹³⁾

q = 1-p=1-0.13= 0.87.

d= precision (d=3%).

$$N = \frac{(1.96)^2 \times (0.13 \times 0.87)}{(0.03)^2} = 482.$$

The sample size required 482 Students.

N.B: we added 10 % (=48)to sample size to avoid any miss leading results as absent of some students during data collection..., so the final sample size equal 482 + 48 =530 students.

D. Sample Method:

We use the multi-stage sampling method as a following:

***Stage (1):** The sample size distributed proportionally among all the (10) schools (Table No. 11) .

* **Stage(2):** The sample size of each school distributed proportionally for each class (tables No.12-21) .

***Stage(3):** The sample size required from each class was selected by simple random sample.

E. Data collection and tools:

The data were obtained during 7/3/2014 by the self-pretested questionnaire which including the following:

1. Personal data.
2. Questions related to the knowledge of effects of tobacco chewing on health.
3. Questions related to the prevalence of tobacco chewing.
4. Questions related to the factors influencing tobacco chewing.
5. Questions related to the factors that inhibit tobacco chewing.

F. Pre-Test:

The questionnaire of the study was conducted to 20 students of secondary schools in Jeddah city. The sample of students used in this pre-test was not include in the study. The questionnaire was pre-tested to determine the length of interview, question sequence, and the identification of difficult words. The questionnaire was initially constructed in the English language, which was later translated into Arabic language.

G. Data analysis:

The data were checked for completeness, coded then were entered into computer by Statistical Package for Social Sciences (Portable IBM SPSS Statistics v19). Then analyzed by using descriptive Statistical tools (frequencies, percentage), Chi-square test was used to test associations between independent and dependent variables. The level of statistical significance was set at $p < 0.05$. The mean and Standard Deviation (SD) were also calculated for continuous variables. And data were presented in tables and graphs by using computer application (excel and word).

H. Statistical analysis:

The knowledge about the effects of tobacco chewing on oral health was determined for: 1) oral cancer; 2) periodontal diseases. Knowledge about the tobacco chewing as a cause of oral cancer/periodontal disease was assessed by summing the scores for the responses to the following three statements 'people chewing tobacco are more likely to develop oral cancer /periodontal disease than non-tobacco chewing' 'heavy tobacco chewing users are more likely to develop oral cancer /periodontal diseases than sporadic (light) users of tobacco chewing' and 'A person who is chewing tobacco for many years is more likely to develop oral cancer/periodontal diseases than a person who chewed for a short duration'. A score of three points was assigned to correct response of each of the question statements and one point to "do not know" response of each question statement and zero for incorrect response of each of the question statements. This gave a maximum score of 9 points that denotes excellent knowledge and a minimum score of zero denoting complete lack of knowledge. A respondent was regarded highly knowledgeable if scored 6.75 - 9.0 points, moderately knowledgeable if scored 4.50 - 6.74 points and lowly knowledgeable if scored less than 4.5 points.

The five perceived factors inhibiting a person to start chewing tobacco, were assessed by the statement of 'To what degree do you think that the following factors may inhibit a person from chewing tobacco?' The responses were categorized into a Likert scale of 4 categories ranging from 1= extremely do not inhibit, to 4= inhibits extremely. Frequency distribution and descriptive statistics used to obtain the mean agreement score and the percentage score of each option.

I. Ethical consideration:

Approval of the project will obtained from king Abdulaziz University College of Medicine, Department of Community Medicine. Objectives of the study were clarified for participants.

We ensure those who agree to participate and be involved in our study that their information will be kept in a strictest confidence and will be used only for the benefit of community.

IV. RESULTS AND DISCUSSION

A. Results:

The results of the study showed that :-

* The prevalence of tobacco chewing among male secondary school students in Jeddah city was 28.7% .(Table No.1)

* According to each secondary schools the distribution of tobacco chewing was as following: **School I** "36.5%", **School II** "33.7%", **School III**"33.3%", **School IV** "28.6%", **School V** "24%", **School VI** "23.5%", **School VII** "20%", **School VIII** "20%", **School IX** "16.7%" and **School X** "0%" . (Graph No.1)

* The distribution of tobacco chewing according to the 3 grades of the secondary school was: 1st grade "34.54%", 2nd grade natural sciences section "13.9%", 2nd grade human sciences section "30%", 3rd grade natural sciences section "28.1%", 3rd human sciences section "34.8%" . (Graph No.2)

* Students in public and private secondary schools showed no statistically significance difference in proportion of students who chewed tobacco in these schools (*public* "24.1%" *private*"22.2%" $P=0.38$) .(Table No.2)

- * The percentage of the secondary school students who said they know about the hazards of tobacco chewing was 462 "87.2%" with statistical significance difference between those who chewed tobacco and those who did not (*tobacco chewed "75%" , non-tobacco chewed 92.2%, P=0.00*).(Table No.3)
- * The percentage of the secondary schools students who knew that tobacco is containing a substance called Nicotine was 158 "24.8%" with no statistical significance difference between those who chewed tobacco and those who did not (*tobacco chewed "24.3%" , non-tobacco chewed "32%", P=0.11%*).(Table No.3)
- * The percentage of the secondary school students who knew there is a relationship between tobacco chewing and oral cancer was 379 "71.54%" with statistical significance difference between those who chewed tobacco and those who did not (*tobacco chewed "54.6%" , non-tobacco chewed "78.3%" P=0.00*). (Table No.3)
- * The percentage of the secondary school students who knew there is a relationship between tobacco chewing and periodontal diseases was 411 "77.6%" with statistical significance difference between those who chewed tobacco and those who did not (*tobacco chewed "66.44%" non-tobacco chewed "82%" P= 0.00*). (Table No.3)
- * The percent of students we considered them highly knowledgeable on relationship between chewing tobacco and occurrence of oral cancer was "61.7%". (Table No.4)
- * The percent of students we considered them highly knowledgeable on relationship between tobacco chewing and occurrence of periodontal diseases was "64%". (Table No.5)
- * The largest percent of tobacco chewing students started to use tobacco in preliminary school (53.9%), then primary school (29%) and the smallest was secondary school (17.1%) . (Table No.6)
- * The majority of tobacco chewing students are chewing tobacco more than 2 times daily (83.6%). (Table No.7)
- * The majority of tobacco chewing students have a another family member who is chewing tobacco (64.5%) . (Graph No.3)
- * The largest factors that perceived students to start chewing tobacco was "*influence of friends*" "60.5%", then "*living with person like parents and sibling who chew tobacco*" "14.5%". (Graph No.5)
- * Tobacco smoking was significantly higher among tobacco chewing students comparing with non-chewing [(25% , 2.9% , P=0.00) and (30.3% , 4.5% , P=0.00)]. (Table No.8)
- * There was a high percentage "67.8%" of tobacco chewing students who are wishing to stop tobacco chewing . (Table No.9)
- * Most of the students agreed that "*good guidance from parents , knowing detrimental health effects caused by chewing tobacco and religious teaching*" were perceived as important factors that may inhibit a person from start chewing tobacco. These factors have the highest mean scores, 3.86(0.51) , 3.61(0.78) and 3.46(0.93) respectively . (Table No.10)

B. DISCUSSION:

- Since the study relied on self-reported data, the prevalence of tobacco chewing may be lower than the actual percent, possibly due to underreporting, because some students may feel frightened and uncomfortable to report that they are chewing tobacco .
- In this research the prevalence of tobacco chewing was 28.7% which is higher than the prevalence of tobacco chewing among young adults in France (2009) which was 11%, and higher than the prevalence of tobacco chewing among rural residents individuals aged more than 15 years in India (2008) which was 17.5%, and higher than the prevalence of tobacco chewing among adults in Bangladesh (2009) which reported to be 20.6%. The reported prevalence of tobacco chewing among students in United States (1995) and India (2010) was 39% and 32.9% respectively which is higher than the prevalence of our study .⁽¹⁴⁻¹⁸⁾
- In our study the largest percentage of tobacco chewing students was among 3rd grade students which is similar to a result of a study conducted in Arkansas, USA (1986), in the other hand, in "Dar es Salaam study" (2011) the 2nd grade students were the largest group .^(19,20)
- In our study the prevalence of tobacco chewing was higher among public school students (29.1 %) than private school students (22.1 %), similar to another study conducted in india (2009) with higher prevalence among public school

students (13.4%) than private school students (11.7%). in the other hand, our result is different from "Dar es salaam" study (2011) their result came with higher prevalence among private school students (4.7%) than public school students (4.3%).^(20,21)

- Our study showed no statistically significant difference between public and private schools, this is similar to the result of "Dar es salaam" study (2011).⁽²⁰⁾

- Our study showed that (87.2%) of students are aware of the hazards of tobacco chewing, this is similar to other studies, a study conducted in Nepal (2003) came up with (91.4%), and another study conducted in Jaipur (India) (2004) came up with (99.2%). This difference may be due to the difference in health education programs about hazards of tobacco chewing.^(22, 23)

- The results of our study showed that (70.2%) of students are unaware of the nicotine component of tobacco, which is similar to the result of another study conducted in Tanzania (2006) came up with (68.9%), this indicate that students don't know a lot about the components of tobacco.⁽²⁴⁾

- In our study; (71.5%) of students were aware about the relationship between tobacco chewing and occurrence of oral cancer, similar to many other studies: Great Britain (2004); Australia (2003) and Kuwait (2006), the results were varied from (62.6%) to (85.5%). In the other hand other studies were different; Sri-lank (2005) and Nigeria (2010) were (47%) and (11%) respectively. This indicate that the majority of students in our study had adequate level of knowledge about the relationship between tobacco chewing and oral cancer.⁽²⁵⁻²⁹⁾

- A good number of students in our study 64% were highly knowledgeable on relationship between chewing tobacco and occurrence of periodontal disease. Other studies came with higher percent like: united kingdom (2009) and Kuwait (2006), 80.44% and 76.2 respectively. While other studies came with much lower percent like: Nigeria (2010) and united kingdom (2005), 2.2% and 6% respectively.^(25,27,29,30)

- In our study, large number of tobacco chewing student started chewing during preliminary school 53.9%. this is similar to other studies conducted in Maharashtra (India) 2010 (47.5%) and in Tanzania 2008 (57.2%). While other study conducted also in (India) 2009 came with higher percent 70% of tobacco chewing students started chewing in secondary school.^(31,21,24)

- In our research, (83.6%) percentage of tobacco chewing students are chewing more than 2 times a day. Another study conducted in Arkansas (USA) 1986 came with much less percent 52.4%.⁽¹⁹⁾

- Most of the tobacco chewing students have another family member chewing tobacco (64.5%), the percent is almost the same as the one of Karnataka (India) study 2001 which was 68.3% and slightly lower than the one of Maharashtra (India) study 2010 which was 75.8%. This reflect the actual size and magnitude of this problem in the community of these studies.^(32,31)

- Most of the tobacco chewing students chose "*influence of friends ,living with person like presents and siblings who chow tobacco, and not knowing the health effects of the tobacco chewing*" as important factors that may lead someone to start chewing. These factors are similar to the chosen factors in other studies: USA 2001, Nairobi 2003, Cyprus 2006, Ethiopia 2007, and Nigeria 2010. Therefore tobacco prevention policies should target these factors.⁽³³⁻³⁷⁾

- In our study 25% of tobacco chewing students are also smoking tobacco, this percentage is higher than the one of Maharashtra (India) study 2010 which was 11.25%, and lower than the one of USA study 2001 which was 45%, these findings reflect the strong association between the chewing of tobacco and the smoking .^(31,33)

- In our study, 67.8% of the tobacco-chewing students do wish to stop chewing. This is almost similar to the percent of the USA study 2008, which was 70%, and much higher than the percent of the Arkansas-USA study 1986 which was 28.2%. Our high percentage maybe due to the easy means by which students can acquire the tobacco in Saudi Arabia.^(39,18)

- Large number of students chose "*good gaudiness from of parents ,knowing health effects caused by chewing tobacco and religious teaching*" as important factors that may prevent students from chewing tobacco. This percentage is similar to many other reported studies (USA 2001, Malawi 2008, Sub- Sahara Africa 2003 and India 2010). Therefore, tobacco prevention policies should emphasize on these factors.^(33,40,41,18)

C. Figures, Graphs and Tables:

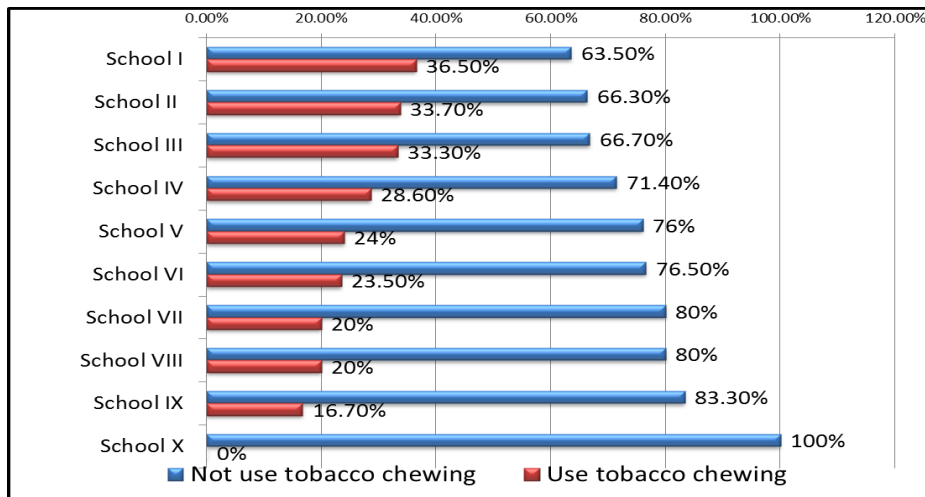
*Table No.(1): The prevalence of tobacco chewing among male secondary school students in Jeddah city during year 2014:

Tobacco	Frequency	Percentage
Users	152	28.7
Not users	378	71.3
Total	530	100

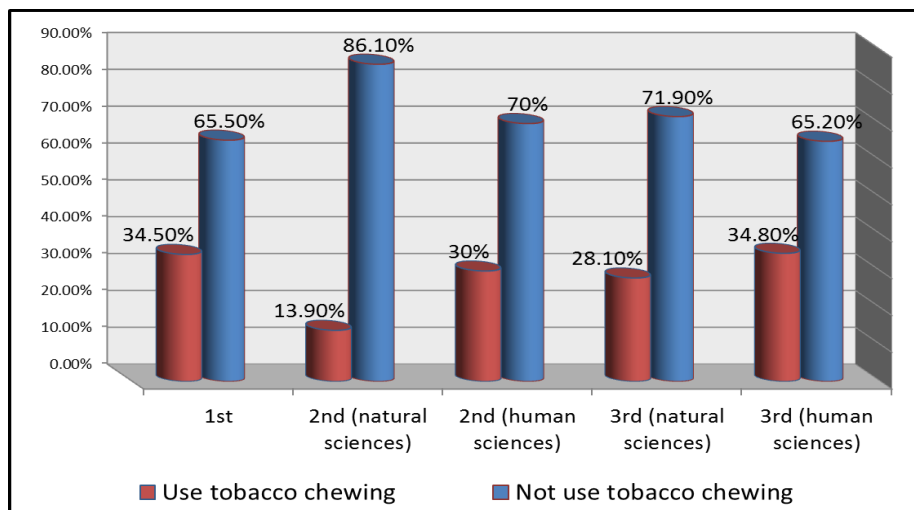
*Table No.(2): Distribution of tobacco chewing according to type of school among male secondary school students in Jeddah city during year 2014

Type of school		Not use tobacco chewing	Use tobacco chewing	Total
Public	Frequency	144	350	494
	Percentage	29.1	70.9	93.2
Private	Frequency	8	28	36
	Percentage	22.2	77.8	6.8
Total	Frequency	152	378	530
	Percentage	28.7	71.3	100

N.B: Chi-square test $P=0.38$ (No. statistical significance)



*Graph No.(1): Distribution of tobacco chewing according to type of school among male secondary school students in Jeddah city during year 2014



*Graph No.(2): Distribution of tobacco chewing according to grades of secondary school in Jeddah city during year 2014:

***Table No.(3): Frequency distribution and percentage of knowledge among male secondary school students in Jeddah city during year 2014**

Questions	Option	Use tobacco chewing		Not use tobacco chewing		Total		P-value*
		Freq	%	Freq	%	Freq	%	
Are there health hazards of tobacco chewing?	Yes	114	75	348	92.1	462	87.2	0.00
	No	26	17.1	16	4.2	42	7.9	
	Don't know	12	7.9	14	3.7	26	4.9	
Is the tobacco contain nicotine substance	Yes	37	24.3	121	32	158	29.8	0.11
	No	40	26.3	74	19.6	114	21.5	
	Don't know	75	49.4	183	48.4	258	48.7	
Is there relationship between tobacco chewing and oral cancer	Yes	83	54.6	296	78.3	379	71.5	0.00
	No	28	18.4	19	5	47	8.9	
	Don't know	41	27	63	16.7	104	19.7	
Is there relationship between tobacco chewing and periodontal diseases	Yes	101	66.4	310	82	411	77.6	0.00
	No	24	15.8	10	2.6	34	6.4	
	Don't know	27	17.8	58	15.3	85	16	
Total		152	28.7	378	71.3	530	100	

N.B: *Chi-square test ($P < 0.05$ is considered statistical significance)

***Table No.(4): Classification of students based on their level of knowledge about the relationship between tobacco chewing and occurrence of oral cancer**

level of knowledge		Frequency	Percent
	High	327	61.7
	Moderate	127	24.0
	Low	76	14.3
	Total	530	100.0

***Table No.(5): Classification of students based on their level of knowledge about the relationship between relationship between tobacco chewing and occurrence of periodontal diseases**

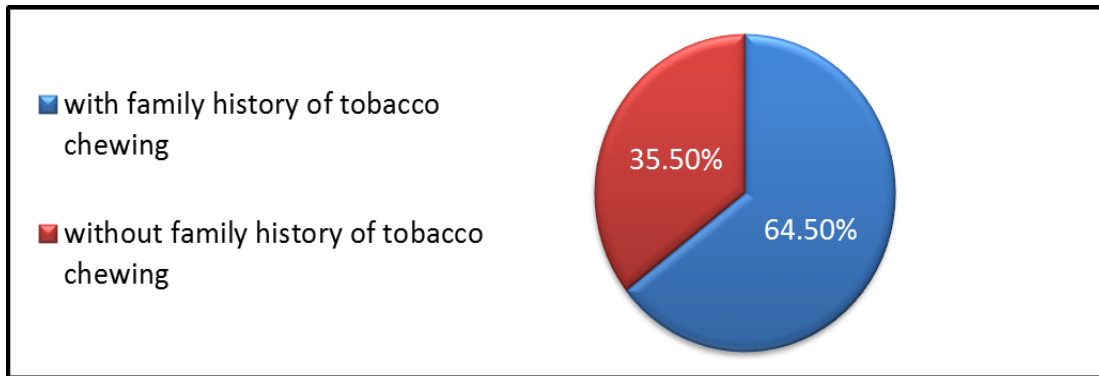
level of knowledge		Frequency	Percent
	High	339	64.0
	Moderate	133	25.1
	Low	58	10.9
	Total	530	100.0

***Table No.(6): Distribution of tobacco chewing students based on the time they started chewing:**

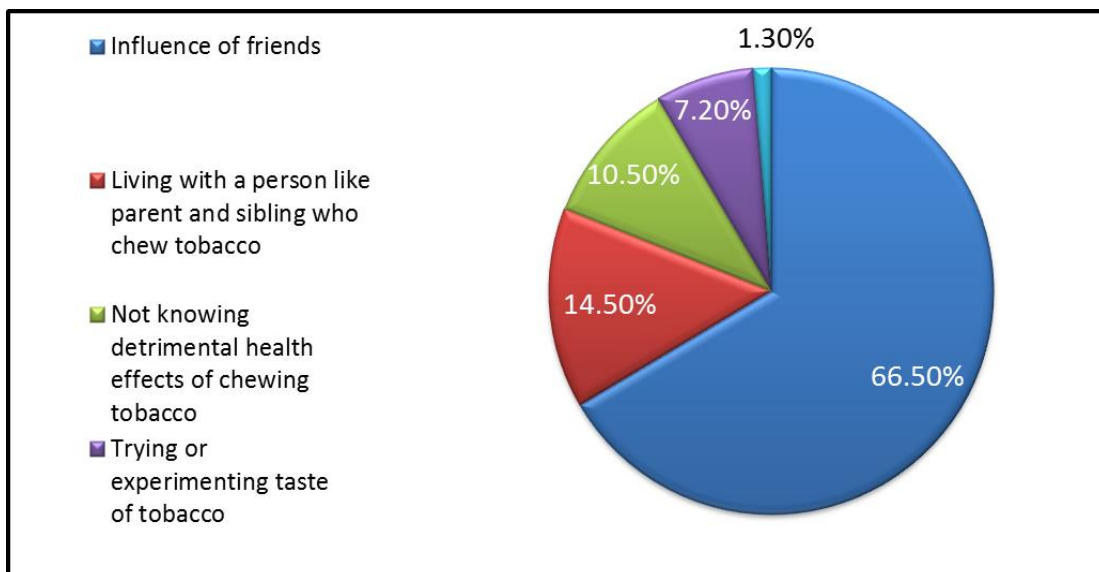
School	Frequency	Percent
Primary	44	29
Preliminary	82	53.9
Secondary	26	17.1
Total	152	100.0

***Table No.(7): Distribution of tobacco chewing students based on how many times are they chewing daily:**

Frequency of use daily	Frequency	Percent
One or less	7	4.6
Two	18	11.8
More than two	127	83.6
Total	152	100.0



*Graph No.(3): Percent of students who have a family history with tobacco chewing :



*Graph No.(4): Percent of factors that were perceived to influence a person to start chewing:

*Table No.(8): The percent and frequency of tobacco smoking students in comparison between those who are chewing and those who are not chewing: *N.B.*Chi-square test (P<0.05 is considered statistical significance)*

Habit	Option	tobacco chewing		Not tobacco chewing		Total		P-value*
		Freq	%	Freq	%	Freq	%	
Tobacco smoking	Yes	38	25	11	2.9	49	9.2	0.00
	No	114	75	367	97.1	481	90.8	
Total		152	28.7	378	71.3	530	100	

*Table No.(9): Mean agreement score and distribution of respondents by level of agreement to 5 factors that were perceived to inhibit a person from chewing tobacco among male secondary school students in Jeddah city during year 2014 (minimum score =1; maximum score = 4):

Perceived factor	Agreement Score*	Extremely agree	Agree	Not agree	Extremely not agree
Knowing health effects caused by chewing tobacco	3.61(0.78)	398(75.1%)	77(14.5%)	33(6.2%)	22(4.2%)
Good guidance from parents	3.86(0.51)	483(91.1%)	26(4.9%)	13(2.5%)	8(1.5%)
Religious teachings	3.46(0.93)	367(69.3%)	82(15.5%)	40(7.5%)	41(7.7%)
Withdraw tobacco from the market and prevent the sale	2.99(1.02)	213(40.1%)	153(28.9%)	108(20.4%)	56(10.6%)
Tobacco being expensive	3.28(0.99)	307(57.9%)	114(21.5%)	60(11.4%)	49(9.2%)

*Mean(sd)

*Table No.(10): Distribution of tobacco chewing students based on their wishing to stop shewing:

Response	Frequency	Percent
Yes	103	67.8
No	49	32.2
Total	152	100.0

V. CONCLUSION

- 1) The prevalence of tobacco chewing among secondary school students in Jeddah city appears to be high.
- 2) The prevalence of tobacco chewing was higher among 3rd grade "human sciences." and 1st grade of secondary school students.
- 3) The prevalence of tobacco chewing was higher among public schools compared to private schools without statistical significant difference.
- 4) The majority of students have a good knowledge on detrimental effects of tobacco chewing on health.
- 5) Most of tobacco chewing students started chewing during preliminary school.
- 6) There was high percentage of tobacco chewing students have another one in their family use tobacco chewing.
- 7) Most of the tobacco chewing students are chewing more than 2 times a day.
- 8) The most common factor that perceived students to start chewing tobacco was the influence of friends.
- 9) Tobacco smoking was significantly higher among tobacco chewing students comparing to the non-chewing ones.
- 10) There is a high percentage of tobacco chewing students who are wishing they stop chewing.
- 11) The Factors students chose as inhibitor to start chewing were *"good guidance from parents, knowing detrimental health effects caused by tobacco chewing and religious teachings"*.

VI. RECOMMENDATIONS

- * There is a need for intervention among secondary school students to prevent possible continued trend of tobacco chewing.
- * Essential components of such program should include: raising awareness about the detrimental effects of tobacco chewing on health, as well as demoting factors that have been identified as potential provoking factors to start chewing, and promoting factors that have been identified as potential inhibitors for chewing tobacco, and should be involving parents, teachers and religious leaders within the program.
- * The importance of starting an intervention at this age can be demonstrated by 3 statements. First one, it would help those who have not started chewing tobacco not to start. Second one, it will help those who are chewing tobacco to not become heavily addicted. Third one, quitting tobacco chewing early is associated with lesser chance of developing oral cancer and periodontal diseases
- * Because most of the tobacco-chewing students started chewing during preliminary school, it is very important to raise health awareness regarding hazards of tobacco chewing to preliminary school students as a preventive procedure.
- * Parents / guardians and other family members should not ask children to buy a tobacco products or even a lighter for them and they should not chew in front of the younger family members.
- * There is a need for a large countrywide study to identify the magnitude of tobacco chewing in other regions of the country.

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ANNEXES

***Table No.(11): Distribution of sample size proportional in each secondary school in Jeddah city**

NO.	School	No. of students	Percentage %	Sample size
1	I	53	1	5
2	II	238	4.3	23
3	III	790	14.2	75
4	IV	1668	30	159
5	V	50	0.9	5
6	VI	151	2.7	14
7	VII	869	15.6	83
8	VIII	121	2.2	12
9	IX	1211	21.8	115
10	X	408	7.3	39
	Total	5559	100	530

***Table No.(12): Distribution of sample size in secondary school number I in Jeddah city:**

Grade	No. of students	Percentage %	Sample size
1 st	382	43.9	36
2 nd (natural Sciences)	161	18.5	15
2 nd (human sciences)	124	14.3	12
3 rd (natural sciences)	103	11.9	10
3 rd (human sciences)	99	11.4	10
Total	869	100	83

***Table No.(13): Distribution of sample size in secondary school number II in Jeddah city**

Grade	No. of students	Percentage %	Sample size
1 st	40	33.05	4
2 nd (natural Sciences)	40	33.05	4
2 nd (human sciences)	0	0	0
3 rd (natural Sciences)	41	33.9	4
3 rd (human sciences)	0	0	0
Total	121	100	12

***Table No.(14): Distribution of sample size in secondary school number III in Jeddah city**

Grade	No. of students	Percentage %	Sample size
1 st	20	40	2
2 nd (natural Sciences)	30	60	3
2 nd (human sciences)	0	0	0
3 rd (natural Science)	0	0	0
3 rd (human sciences)	0	0	0
Total	50	100	5

***Table No.(15): Distribution of sample size in secondary school number IV in Jeddah city**

Grade	No. of students	Percentage %	Sample size
1 st	69	45.7	6
2 nd (natural Sciences)	50	33.1	5
2 nd (human sciences)	0	0	0
3 rd (natural Sciences)	32	21.2	3
3 rd (human sciences)	0	0	0
Total	151	100	14

***Table No.(16): Distribution of sample size in secondary school number V in Jeddah city**

Grade	No. of students	Percentage %	Sample size
1 st	430	35.5	41
2 nd (natural Sciences)	265	21.9	25
2 nd (human sciences)	183	15.1	18
3 rd (natural Sciences)	214	17.7	20
3 rd (human sciences)	119	9.8	11
Total	1211	100	115

***Table No.(17): Distribution of sample size in secondary school number VI in Jeddah city**

Grade	No. of students	Percentage %	Sample size
1 st	68	28.6	7
2 nd (natural Sciences)	86	36.1	8
2 nd (human sciences)	0	0	0
3 rd (natural Sciences)	84	35.3	8
3 rd (human sciences)	0	0	0
Total	238	100	23

***Table No.(18): Distribution of sample size in secondary school number VII in Jeddah city**

Grade	No. of students	Percentage %	Sample size
1 st	322	40.8	31
2 nd (natural Sciences)	204	25.8	19
2 nd (human sciences)	48	6.0	4
3 rd (natural Sciences)	166	21.0	16
3 rd (human sciences)	50	6.3	5
Total	790	100	75

***Table No.(19): Distribution of sample size in secondary school number VIII in Jeddah city**

Grade	No. of students	Percentage %	Sample size
1 st	29	54.7	3
2 nd (natural Sciences)	24	45.2	2
2 nd (human sciences)	0	0	0
3 rd (natural Sciences)	0	0	0
3 rd (human sciences)	0	0	0
Total	53	100	5

***Table No.(20): Distribution of sample size in secondary school number IX in Jeddah city**

Grade	No. of students	Percentage %	Sample size
1 st	150	36.7	14
2 nd (natural Sciences)	0	0	0
2 nd (human sciences)	130	31.9	13
3 rd (natural Sciences)	0	0	0
3 rd (human sciences)	128	31.4	12
Total	408	100	39

***Table No.(21): Distribution of sample size in secondary school number X in Jeddah city**

Grade	No. of students	Percentage %	Sample size
1 st	561	33.6	53
2 nd (natural Sciences)	285	17.1	27
2 nd (human sciences)	241	14.4	23
3 rd (natural Sciences)	293	17.6	28
3 rd (human sciences)	288	17.3	28
Total	1668	100	159