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Snuff Usage and Knowledge Regarding Its Effects Among Pakistani Male Students of Public Medical University, Peshawar

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Abstract: In Pakistan, snuff, locally known as Naswar, was introduced decades ago, and is usually processed into a loose moist form, and its use is widespread in the country. The evaluation of carcinogenic risks of smokeless tobacco by the International Agency on Research for Cancer (IARC) has confirmed that smokeless tobacco is carcinogenic to human and the main target organ being the oral cavity where the products are applied locally. So, this study is done about snuff usage and knowledge regarding its effects among Pakistani Male Students in Khyber Medical University, Peshawar. Descriptive cross sectional institutional based study with sample size of 400 was done from 5251 the study population (Pakistanis male students at the Khyber Medical University, Peshawar) during the academic year 2018-2020, in which random sampling technique was used. Data was collected using self-administrated questionnaire. Data were analyzed using statistical package for social science (SPSS) (IBM v. 25). The overall knowledge level was very high within non-snuff dippers i.e., 92%, which was very high according to Likert measure, whereas the knowledge level among snuff dippers was (76.4%) which was also high. The prevalence of snuff usage among Pakistani male students was 174 (43.5%) n = 400. The greatest predisposing factor was the friend's effect (81.5%), whereas the least predisposing factor was the advertisement effect (23.8%). There was a significant relationship between knowledge level and snuff usage. In conclusion, snuff usage prevalence among students was high, the overall knowledge level was very high, effect of friends was the most common risk factor for snuff usage, so there is an urgent need for intervention by providing tobacco prevention program for raising awareness regarding to the health hazards of tobacco use and counselling to help and encourage users for cessation and to prevent tobacco initiation.

Keywords: Naswar, Smokeless Tobacco, University Students, Carcinogens, Knowledge, Perception

1. Introduction

Snuff, also known as Naswar in Pakistan, was first introduced about 400 years ago and is commonest smokeless tobacco (SLT) product. It is always manufactured into a loose moist form, and its consumption is extensive throughout the country. Naswar is made from Nicotiana Rustica tobacco, and the fermented ground powder is blended with an aqueous sodium bicarbonate solution. The resulting product is moist, has a strong aroma, is highly addictive, and is popular, — in particular between males especially youth. It has a pH of 8-11, an amount of moisture of 6-60%, and a nicotine content of 8 to 102 mg/g dry mass [1]. The most common types of oral mucosal soft-tissue lesions caused by smokeless tobacco

and tobacco products are oral squamous cell carcinoma (SCC) and Verruca's carcinoma, as well as oral chronic inflammatory disorders (OPMDs) (leukoplakia, erythroplakia and erythro-leukoplakia). The International Agency for Research on Cancer (IARC) evaluated the cancer - causing potential dangers of smokeless tobacco and affirmed that it is cancer-causing to humans, with the main targeted organ being just the oral cavity in which the ingredients are applied locally [2]. In Pakistan, preparation of smokeless tobacco (Naswar), is inexpensive and poorly regulated. Oral cancer which is ranked the sixth amongst all cancer types in Pakistan is strongly associated with this habit. a broad range of psychological, social, environmental, and genetic factors are linked with the use of tobacco and its by-products [3, 4].

Snuff is the most commonly used SLT product in Asian countries and has a number of local variations. Moist snuff is locally referred to as chemma and is the most used product in Asian countries. Naswar is a moist tobacco product that is used in Pakistan. Dry snuff is referred to as Neffa in Asian countries. Taaba is a dry snuff that can be applied to the gums or the soft palate although it is most generally aspirated through the nasal passages. This type of Snuff is local to Sri Lanka, Afghanistan, India, and Iran. SLT products' ingredient profiles and accompanying toxicity levels differ across Asian countries. Higher pH values have been linked to more severe abnormalities, lending to the idea that such a higher component pH is linked to increased toxicity. A literature review of factors associated with the development of oral cancer in Pakistan discovered a connection between the use of Naswar and the risk of developing oral cancer [5]. Smokeless tobacco is used orally or nasally and therefore is consumed without combusting the product. Sublingual SLT products are absorbed (dipped) or chewed after being located in the tongue, buccal mucosa, or lip. Pollutants in smokeless tobacco make a contribution to the development of oral cancers and the risk of other neck and head cancers. Naswar; the product constituents are tobacco and sodium bicarbonate, and the geographic location of use is Pakistan. The component is rolled into something like a ball that weighs about 10g and is known as a Saffa. The saffa is managed to hold between the gum and the lip or cheek, or on the floor of the mouth under the tongue. It gradually sucks for 10 to 15 minutes [6].

Cultural norms, risk awareness as well as social influences, and are among the many considerations. These components could be closely linked to stress reduction, peer pressure, life problems, social acceptance, a family background of tobacco use, parents with a lower level of education and a desire to accomplish a high personality profile. Children who have parents or friends and family who smoke seem to be more likely to start smoking themselves, according to research. Experimenting with tobacco use, on the contrary, may be a direction to rebel against adult authority, bond with peers, or develop personal identity [6]. Tobacco continues to be a serious threat to worldwide health, killed approximately 6 million individuals annually and causing tens of billions of dollars in damage to the economy in the form of increased health-care expenses and lost productivity. Tobacco use represents the most frequently reported substance abuse among students. There is currently no official tobacco control policy in Pakistan that specifically targets adolescents [7].

One of the most significant barriers to efficient intervention to address public healthcare needs is a lack of understanding of the nature of the problem. This is most evident at the point between determining the effectiveness of interventions and implementing them in policies and practices. While global estimates of the scale of the issue exist, actual measurement of the significant degree and influence at the local and national level is most often suffering from a lack [8]. In developing programs against tobacco habits of adolescents', there is need to aim the impact of friends and parents because they have great significance [9]. This study aimed to get baseline information about the Naswar use among Pakistani university students, including their knowledge about Naswar associated health risks and thoughts and opinions towards their role in controlling the use Naswar.

Majority of male snuff dippers patients when they are attending to dental hospitals and are asked about the age of initiating the snuff usage, they answered that secondary schools and university, so young males in universities must be the targeted group to investigate and eradicate the problem. To determine the magnitude of the problem and the driving factors we have to measure the frequency of the snuff usage and to assess the knowledge regarding its usage because the degree of awareness and recognition of harmfulness of a condition on health can reduce the rate of usage. After investigating the problem, we will be able to design suitable public health program for smokeless tobacco prevention among youth. This study was done to study snuff usage and knowledge regarding its effects among Pakistanis male students in Khyber Medical University, Peshawar 2019.

2. Methodology

It was a descriptive cross sectional institutional based study done at Khyber Medical University, Peshawar. Khyber Medical University, Peshawar has 21 colleges arranged in 4 complexes. Khyber Medical University, Peshawar has 5251 male students for 21 colleges.

2.1. Study Duration

January 2019 – February 2020 (one year).

2.2. Study Population

Pakistani male students from Khyber Medical University, Peshawar during academic year 2019 – 2020.

2.3. Inclusion Criteria

Pakistani male students present at the time of the study.

2.4. Exclusion Criteria

1) Students who refuse to participate.
2) Absent students during the study period.

2.5. Sample Size

Since we had the full frame of all male students at Khyber Medical University, Peshawar divided by their colleges. Then the formula for calculating the sample size for a finite-population (Students Frame) as follows:

$$sample\ size = \frac{\frac{z^2 * p(1-p)}{e^2}}{1+(z^2 * p\frac{1-p}{e^2 N})}$$

e: Desired margin of error = 5%;

p: The estimated proportion of snuff usage in the population. = 0.5;

z: Critical value of standard deviation curve at zero level. =1.96;

N: The population size (frame size). = 5251;

Based on the formula above with a population size (N = 5251), confidence level 95% (z = 1.96), margin of error (e = 5%), and (p = 0.5) the initial sample size is 358 and by adding 10% as margin of non-response rate the final sample size will approximately be 400.

2.6. Sampling Technique

Random sampling technique was to select a sample of 400 students from all the students at Khyber Medical University, Peshawar (5251). We followed the Stratified Multi-Stage Technique.

1) Stage 1: Geographical Area (Strata);
2) Stage 2: The College Within the Geographical Area (Primary Sampling Unit);
3) Stage 3: The Level Within the College (Secondary Sampling Unit);
4) Stage 4: Number of Students Within the Level.

2.7. Data Collection

A self-administered questionnaire was used for data collection and was filled with participants in their rest time without any interruption to their lectures. The questionnaire was modified from previous similar studies [10]. Students coming to university regularly 3-5 days per week were selected. The researcher took 20 students per day, so within a month the data was collected (400 Students). The researcher trained 4 colleagues, who assisted in the data collection process.

2.8. Data Management and Analysis

The collected data was coded, entered in master sheet, and analyzed by Statistical Package for Social Sciences SPSS (IBM SPSS Inc., Chicago, version no. 25) software. All statistical analysis was set at 95% confidence level and the level of significance (alpha) 0.05. Descriptive statistics was presented in the form of tables of frequency, charts, and graphs. Likert Measure, Correlation, and Chi-square test was used.

2.9. Ethical Consideration

Approval of the study was obtained from:

1) The Pakistan Medical Specialization Board and Educational developmental center (EDC) ethical committee.
2) The deanship of students affair /Khyber Medical University, Peshawar.
3) Research purposes and objectives were explained to the participants in clear simple words. Participant has right to voluntary written informed consent, withdraw at any time and to no harm (privacy and confidentiality by using coded questionnaire).

3. Results

This study conducted to estimate the prevalence of snuff usage among Pakistanis male students at the Khyber Medical University, to determine the predisposing (initiative/stimulating) factors of snuff usage among them and to assess the knowledge regarding to the side effects of snuff dipping on the oral health among Pakistanis male students at Khyber Medical University, Peshawar.

3.1. The Response Rate

Table 1. *Distribution of sample size by age in each study level/Khyber Medical University, n=400.*

Age Group	Frequency	Percent	Valid Percent	Cumulative Percent
16	1	0.3	0.3	0.3
18	6	1.5	1.5	1.8
19	19	4.8	4.8	6.5
20	29	7.3	7.3	13.8
21	60	15.0	15.0	28.8
22	56	14.0	14.0	42.8
23	52	13.0	13.0	55.8
24	46	11.5	11.5	67.3
25	51	12.8	12.8	80.0
26	32	8.0	8.0	88.0
27	23	5.8	5.8	93.8
28	14	3.5	3.5	97.3
29	3	0.8	0.8	98.0
30	8	2.0	2.0	100.0
Total	400	100.0	100.0	

3.2. Assessment of the Knowledge Regarding to the Side Effects of Snuff Dipping on the Oral Health

Table 2. *Assessment of knowledge regarding the side effects of snuff dipping according to Likert measures. n=400.*

Knowledge	Strongly agree		Agree		Disagree		Strongly disagree	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
People who dip snuff in their oral cavity are more likely to develop oral cancer than non-snuff dippers.	225	63.8%	114	28.5%	22	5.5%	9	2.3%
Heavy snuff dipper is more likely to develop oral cancer than sporadic (lighter)	152	38%	182	45.5%	56	14%	10	2.5%
People who dip snuff in their oral cavity are more likely to develop periodontal diseases than non-snuff dippers.	247	61.8%	121	30.3%	26	6.5%	6	1.5%
Heavy snuff dipper is more likely to develop periodontal disease than sporadic (lighter)	153	38.3%	191	47.8%	49	12.3%	7	1.8%
Total	400	100%	400	100%	400	100%	400	100%

According to Likert measure, the overall mean was 1.63, which means the majority was strongly agree, so it indicates a particularly high level of knowledge. The mean level of knowledge was very high knowledge (strongly agree).

Table 3. *Descriptive statistics for Likert measure for the Assessment of Knowledge regarding to the side effects of snuff dipping (n=400).*

Descriptive Statistics						
	N	Minimum	Maximum	Mean	Std. Deviation	Likert Measure
People who use snuff inside the mouth are more likely to get oral cancer	400	1	4	1.46	0.703	strongly agree
People who use snuff a lot are more likely to get oral cancer than people who use it in small amounts	400	1	4	1.81	0.765	agree on
People who use snuff inside the mouth are more likely to get gum disease	400	1	4	1.48	0.686	strongly agree
People who use snuff a lot are more likely to get oral gum disease than people who use it in small amounts	400	1	4	1.78	0.725	agree on
Overall	400	1	4	1.63	0.72	strongly agree

3.3. Predisposing (Initiative / Stimulating) Factors of Snuff Usage

Table 4. *Predisposing (initiative) Factors of Snuff usage among male students.*

	Factors	Yes		No	
		Frequency	percentage	Frequency	Percentage
1	Influence of friends	326	81.5%	74	18.5%
2	Not knowing the health effects of snuff dipping	180	55%	220	45%
3	Living with parents one of them or both who dip snuff	247	61.8%	153	38.3%
4	Desire to try the feeling of snuff dipping	312	78%	88	22%
5	Thinking that snuff can relieve anxiety	319	79.8%	81	20.3%
6	Advertisement by tobacco industries	95	23.8%	305	76.3%

3.4. Prevalence of Snuff Usage

Which description fits you best in snuff dipping?

Table 5. *Description of snuff dipping status among male students in Khyber Medical University, Peshawar.*

Description of snuff dipping status		
Status	Frequency	Percent
I didn't use	226	56.5%
I took a little	29	7.3%
I took it and I quit	7	1.8%
I take weekly	13	3.3%
I take daily	125	31.3%
Total	400	100%

Table 6. *Classification of sample size into 2 groups (snuff dippers and non-snuff dippers) among male students n=400.*

Classification of Snuff Usage		
Status	Frequency	Percent
Non-Snuff Dipper	226	56.5%
Snuff Dipper	174	43.5%
Total	400	100%

3.5. Parameters of Snuff Dipping Users

Table 7. *Duration of snuff dipping among snuff dippers students; n=174.*

For how many years have you been taking it?		
No. of Years	**Frequency**	**Percent**
1	20	11.5%
2	22	12.6%
3	35	20.1%
4	24	13.8%
5	15	8.6%
6	15	8.6%
7	8	4.6%
8	3	1.7%
9	2	1.1%
10	3	1.7%
11	1	0.6%
Total	148	85.1%
No Response	26	14.9%
Age of initiation		
12 years and younger	9	5.2%
12-18 years old	63	36.2%
more than 18 years old	102	58.6%
Frequency of snuff dipping during the past 30		
zero days	22	12.6%
1-5 days	4	2.3%
10-15 day	19	10.9%
15-20 day	12	6.9%
20-29 day	24	13.8%
every 30 days	84	48.3%
I don't dip snuff currently	9	5.2%
How many times did you usually dip snuff per day?		
once a day	10	5.7%
2-5 times	32	18.4%
6-10 times	42	24.1%
11-20 times	38	21.8%
more than 20 times	40	23.0%
I don't dip snuff currently	12	6.9%
Do you take snuff as the first thing in the morning?		
I don't take it first	61	35.1%
sometimes I take it as the first thing	58	33.3%
I always take it first	43	24.7%
I don't dip snuff currently	12	6.9%
After you have taken it, after how long do you feel the urge to take it again?		
I don't feel like using it at all	15	8.6%
in 60 minutes	103	59.2%
1-2 hours	30	17.2%
2 to 4 hours	8	4.6%
more than 4 hours and less than a day	1	0.6%
1-3 day	1	0.6%
4 days and more	4	2.3%
I don't dip snuff currently	12	6.9%
How long do you put the snuff in your mouth		
5-10 minutes	129	74.1%
10-30 minutes	31	17.8%
30-60 minutes	2	1.1%
I don't dip snuff currently	12	6.9%
Do you sleep with the snuff inside your mouth?		
Yes	22	12.6%
No	113	64.9%
Sometimes	27	15.5%
I don't dip snuff currently	12	6.9%
Its position is inside your mouth		
inside the lower lip	40	23.0%

For how many years have you been taking it?		
No. of Years	**Frequency**	**Percent**
inside the upper lip	107	61.5%
floor of the mouth	2	1.1%
inside the cheeks	1	0.6%
Other	12	6.9%
I don't dip snuff currently	12	6.9%
Do you wash your mouth after removing the snuff from it?		
Yes	77	44.3%
No	41	23.6%
Sometimes	44	25.3%
I don't dip snuff currently	12	6.9%
Do you want to quit taking snuff now?		
Yes	84	48.3%
No	64	36.8%
I don't dip snuff currently	26	14.9%
Do you think you can quit using it?		
Yes	98	56.3%
No	52	29.9%
I don't dip snuff currently	24	13.8%
Did you see any healthy alerts on snuff packages?		
yes, but I didn't really care about it	83	47.7%
yes, it made me think of quitting	21	12.1%
No	52	29.9%
I don't dip snuff currently	18	10.3%

3.6. Knowledge of Snuff Dipping Users

When knowledge was assessed among students at KMU by Chi-square = 19.023, there was high significant P-value = 0.000 (Figure 1). As mentioned in Figure 2, no significant influence of friends was observed as risk factor for snuff dipping among students at Khyber Medical University with Chi-square = 0.221, and P value = 0.638. No significant comparison was observed between snuff dippers and non-snuff dippers in the lack of knowing the health risks as risk factor for snuff dipping among students (Figure 3) with P value = 0.730. When comparison between snuff dippers and non-snuff dippers in the thinking that snuff can relieve anxiety as risk factor for snuff dipping among students with P value = 0.014 (Figure 4).

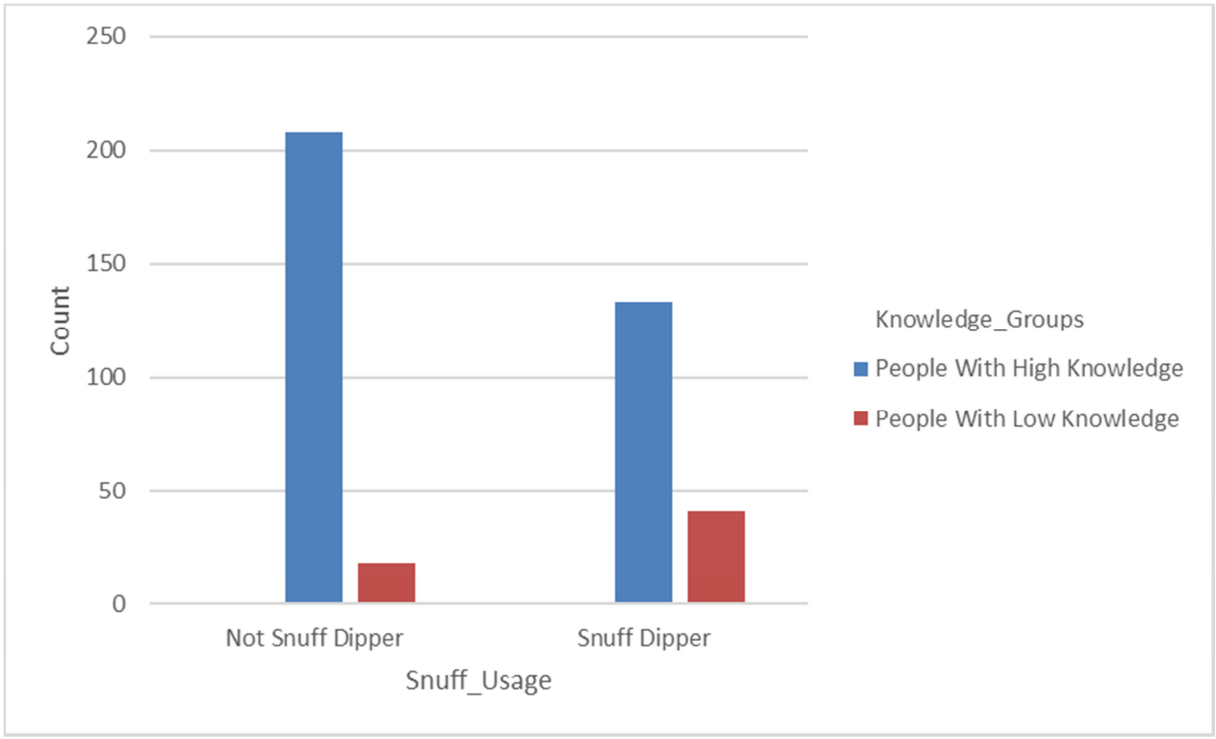

Figure 1. *Comparison between snuff dippers and non-snuff dippers in knowledge assessment level.*

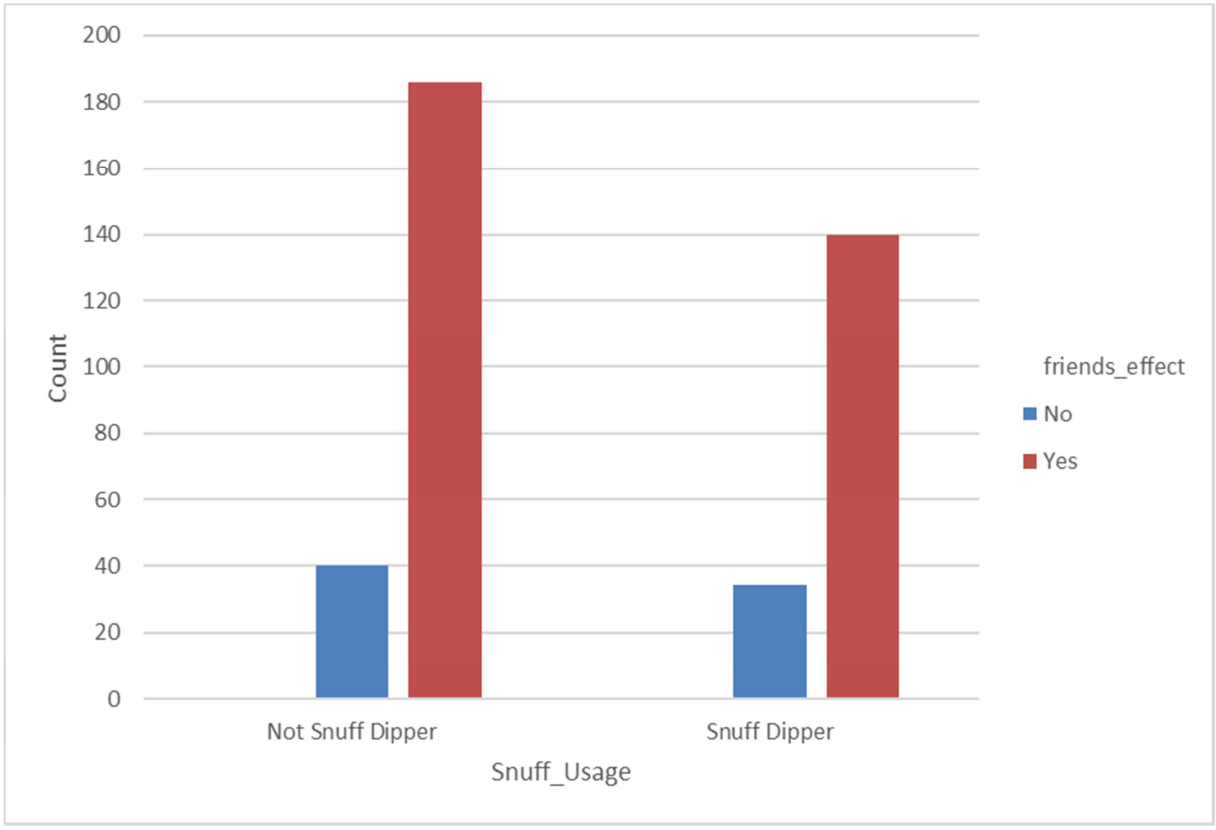

Figure 2. *Comparison between snuff dippers and non-snuff dippers in the influence of friends as risk factor for snuff dipping.*

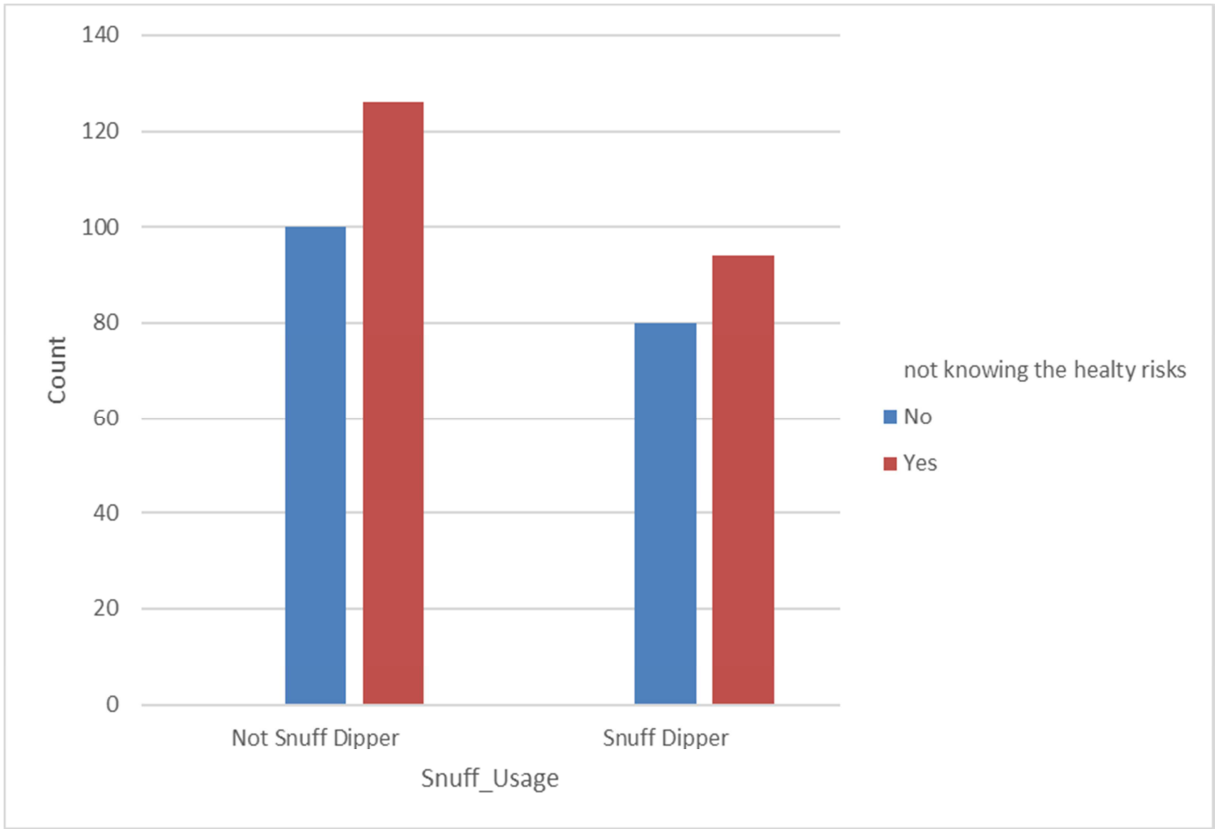

Figure 3. *Comparison between snuff dippers and non-snuff dippers in the lack of knowing the health risks as risk factor for snuff dipping among students.*

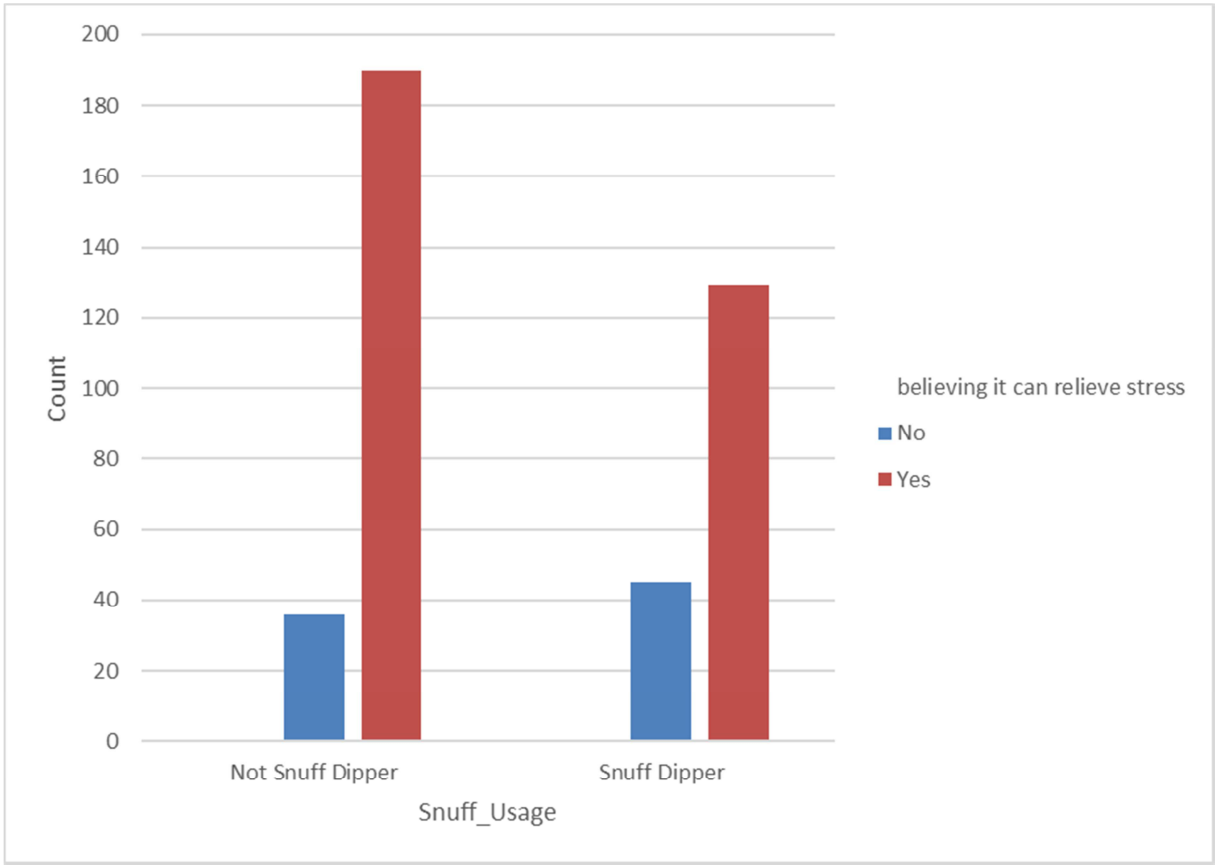

Figure 4. *Comparison between snuff dippers and non-snuff dippers in the thinking that snuff can relieve anxiety as risk factor for snuff dipping among students.*

4. Discussion

Assessment of the knowledge regarding the side effects of snuff dipping on oral health. According to Likert measure, the overall mean was 1.63, which means the majority strongly agree, so it indicates very high level of knowledge as indicated in table 2 and 3. Predisposing (initiative) factors of snuff usage as in table 4, the greatest predisposing factor was friends effect (81.5%), followed by thinking that it relieves anxiety (79.8%) whereas the least predisposing factor was the advertisement effect (23.8%), which is closed to the findings revealed by: Imam et al. " Use of smokeless tobacco among groups of Pakistani medical students – a cross sectional study [11], and Zohaib Khan "A Gaping Gap (Smokeless Tobacco Control in Pakistan)." [7].

Prevalence of snuff usage shown in table 5 and 6 concludes that the overall prevalence of snuff usage was 174 (43.5%) which was high, there were studies revealed similar results conducted by: A. M. Idris et al. about "Naswar Use and Cigarette Smoking in the Sudan" [1], Ahmmed, "The Epidemic of Tobacco Use among the Students of University of Bahri–Khartoum–Sudan-2014." [6], and Amrita Sarkar et al. "A population-based study on tobacco consumption in urban slums" [12]. There was a study that found that the prevalence of tobacco use is higher than this present study which was conducted by C. Althaf Hussain et al about: "Tobacco prevalence and usage pattern among Bengaluru urban slum dwellers" [13].

While this study found that the prevalence of snuff usage was high, in contrast, there were studies found the prevalence of it was low, which were: study conducted by Jones, Dina M. et al. about "Prevalence and Factors Associated with Smokeless Tobacco" [14], study carried out by Ikenna Onoh, et al about "the Prevalence, patterns and correlates of smokeless tobacco use in Nigerian adults" [10] and the study conducted by Sreeramareddy et al. about: "Smoking and smokeless tobacco use in nine South and Southeast Asian countries" [4].

The least group in the initiation of snuff usage was less than 12 year old (5.2%) whereas the majority initiated to use snuff at age more than 18 year old (58.6%) so this indicates that most of youth tend to develop this habit when they were leaving the high school level and move to the university level, and this finding is similar to the study conducted by: Mohammad Hanif Memon et al about: "Knowledge Assessment about Hazards of Smokeless Tobacco Use in Patients coming to a DHQ Hospital" [15]. The lowest percentage of the frequency is (2.3%) for the group who take snuff (1-5) days during the past 30 days whereas the highest percentage of the frequency is (48.3%) for the group who take snuff all the 30 days which also indicates that the snuff usage is highly addictive, table 7.

5. Conclusion

The overall knowledge level was very high according to Likert measure. There was significant relationship between knowledge level and snuff usage, the knowledge level within non-snuff dippers was 92% which was very high, whereas the knowledge level among snuff dippers was (76.4%) which was high, so there is need to raise the knowledge level as a step in the way to prevent snuff usage. The prevalence of snuff usage among Pakistani male students in the Khyber Medical University, Peshawar was 174 (43.5%) n = 400, which was high. The greatest predisposing factor was friend's effect (81.5%) whereas the least predisposing factor was the advertisement effect (23.8%). The range of the duration of using snuff from 1-11 years. The least group in the beginning of snuff usage was less than 12-year-old (5.2%) whereas the majority began to use snuff at age more than 18-year-old (58.6%) so this indicates that most of youth tend to develop this habit when they are leaving the high schools level and move to the university level. There is an urgent need for intervention by providing tobacco prevention program for raising awareness regarding to the health hazards of tobacco use and counselling to help and encourage users for cessation and to prevent tobacco initiation.

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