

## Smokeless Tobacco Use among University Students: A Cross-Sectional Study in Sistan Baloochestan Province, Iran 2008

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**Objective:** It is well known that tobacco smoking is a major preventable cause of morbidity and mortality. Use of smokeless tobacco such as Paan, Nass, Gutka, and Tumbaku is common in South and Southeast Asia but not in Iran, where it is not considered as a normal cultural habit.

**Methods:** A cross-sectional study was carried out in five colleges of Sistan Baloochestan, the Southeastern province of Iran. Three hundred fifty four students, who were selected by convenient sampling, completed a peer reviewed, pre-tested, self-administered questionnaire. The Chi square test and logistic regression analyses were applied.

**Results:** Thirty nine (11 %) students were lifetime users of smokeless tobacco among which nineteen (5.4%) were occasional users, seven (2 %) were current users and thirteen (3.6%) fulfilled the criterion for established users. Paan was the most commonly used form of smokeless tobacco followed by Nass. On univariate analysis, lifetime use of smokeless tobacco showed significant associations with the use of cigarettes, student gender (Male > Female), individual condition (native > guest) and kind of the college (engineering > psychology).

**Conclusion:** The use of smokeless tobacco among students should not be ignored. The governments should add preventive measures against smokeless tobacco use to the existing law against cigarette smoking.

**Declaration of interest:** None.

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### Introduction

Tobacco can be used in ways ranging from cigarette and cigar to chewing of 'smokeless tobacco'. This latter category includes various forms of tobacco with Paan/betel quid being the most common one used (1). Most users put these in the mandibular or labial groove and suck on them slowly for 10-15 minutes or simply apply them to their teeth and gums (the same). The culturally popular product is "Paan", which consists of a number of ingredients, including tobacco, areca nut, slaked lime, and spices. Nass is a commercially powdered mixture containing the same ingredients as Paan. It

was introduced in India nearly three decades ago. Paan, Nass, and gutka are widely used in south and southeastern Asia and their use has spread to other countries (2-12). It is said that betel quid and chewable tobacco is the fourth most commonly used psycho-active substance in the world, ranking after caffeine, alcohol and nicotine (13). Having an ancient history, they are an integral part of the culture and sometimes erroneously believed to have medicinal benefits (13,14). Smokeless tobacco users in India and Pakistan together have been estimated to number 100 million (15). In India about 35-40% of tobacco consumption is in smokeless forms while an earlier study in Pakistan showed that 21% of men and 12% of women were users of betel quid (16). In Pakistan, a recent study among the adolescents and adults of a Karachi squatter settlement reported that 40% of the population was using at least one chewable product of betel, areca and tobacco on a daily basis (17). Unfortunately it is being reported that an increasing trend of

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smokeless tobacco use is occurring among vulnerable groups such as children, teenagers, women, immigrants of South Asian to other countries and also adjacent countries especially near-boundary states (13).

Paan contains areca nut, betel leaf and calcium hydroxide but tobacco and various other spices are also commonly added (18). Industrially prepared mixture of areca nut, lime, catechin containing substance, sandalwood fragrance with tobacco (gutka) or without tobacco (chaalia) were introduced in recent decades, which have contributed to the growth and use of these products (13). Tumbaku and naswar mainly contain tobacco with small amount of spices, areca and betel. Tumbaku is oral chewable form of tobacco while naswar is placed in the oral vestibule (19).

Factors that continue to encourage people to use smokeless tobacco include its affordability, ease of purchase or production, and the widely held misconception that it has medicinal value for improvement in tooth ache, headache and stomach ache (1). Furthermore, in contrast to cigarettes, there is no taboo against using smokeless tobacco and the government efforts have also focused more on eliminating cigarette use than tobacco as a whole (1,14). All these, coupled with peer pressure and the belief that smokeless tobacco is less hazardous than cigarette smoking mean that these forms continue to be used by vast numbers of people. Presently tobacco use is the leading preventable cause of death globally (20) and it is estimated that by 2030, it would account for over 10 million annual deaths worldwide (21,22), 70% of which will be in the developing world (23). All forms of tobacco carry serious health consequences, most importantly oral and pharyngeal cancers (24-26) and other malignancies of the upper digestive tract (21,27). Other ingredients are combined with tobacco to produce a product with an even higher carcinogenicity for humans.

Chewing betel, areca and smokeless tobacco products lead to discoloration of teeth, development of chronic debilitating diseases involving gingival and oral mucosa, and higher mortality among users. These diseases include oral sub mucous fibrosis, oral leukoplasmia, oral cavity and other head and

neck cancers (13,28,29). There is also evidence that smokeless tobacco is a risk factor for hypertension and dyslipidemia (1). Chewing of tobacco by pregnant mothers has been found to cause an increased incidence of still births and low birth weight deliveries. In addition, chewing betel quid, with or without tobacco can aggravate asthma and predispose the users to diabetes mellitus. Regular use of Paan and gutka leads to oral cancer and precancerous conditions (30-34).

It seems that the growing popularity of Paan use in eastern province of Iran has troubled the public health community. The extent of Paan and Nass use in Iran and its consequences have not yet been studied. Iran is a neighbor of Pakistan where smokeless tobacco use is legal and easily available. Until recent years, smokeless tobacco was very rare in Iran, but now its usage is spreading slowly in these parts of the country. It is shown that costs and consequences of tobacco use impose a heavy social and economic burden on a nation. Much of this can be avoided by policies and awareness programs aimed at reducing tobacco use. With this background, this study was conducted with the objective of determining the prevalence of smokeless tobacco use among university students from five different colleges in Sistan-Balouchestan province, located in southeastern Iran, adjacent to Pakistan) as a first step to address this gap in information about the exact extent of Paan or smokeless tobacco use in Iran, especially in the eastern provinces.

The purpose of this study was to explore the patterns of Paan and Nass consumption in the eastern province of Iran, Sistan-Balouchestan. These types of studies have important implications for future smokeless tobacco investigations and interventions in these large, growing communities.

## Materials and Methods

This was a multi-center cross sectional study carried out on students of five colleges of Sistan-Balouchestan University during the period of April-July 2008. The colleges (Engineering, Psychology, Management, Science and Literature) were selected in order to

compare the patterns of tobacco use in students with different conditions.

We included all students of the above mentioned colleges (381 subjects) by census method. Of this, 354 individuals agreed to participate in the study (response rate=92.9%).

For gathering information, a peer reviewed, pilot tested, anonymous self-administered questionnaire was used. Questions asked were regarding occasional, current, and established use of smokeless tobacco. Questions asked were also regarding the form of smokeless tobacco they used, any cigarette smoking, as well as the age at which they took up these habits. Occasional users were defined as those who had used smokeless tobacco at least once or twice in their life. Current users were defined as those who had used smokeless tobacco at least once in the preceding 30 days and established users were those who had used more than 100 times in their lifetime. Relevant demographic information was also obtained.

Ethical approval for the study was obtained from the Ethical Committee of Sistan-Balouchestan University. The nameless questionnaires were collected back in an unmarked envelope to ensure complete confidentiality. The study was conducted in compliance with the 'Ethical Principles for Medical Research involving Human Subjects' of Helsinki Declaration (35). Verbal informed consent was obtained from all subjects and documented in the presence of a witness.

Data was entered and analyzed with Statistical Package for Social Sciences (SPSS) version 15.0. Descriptive statistics of socio-demographic information and use of chewable tobacco products were obtained. Univariate and multivariate odds ratio (OR) with 95 percent confidence interval (CI 95%) were obtained using the Chi square test and logistic regression analyses, respectively. For all purposes, a p value of <0.05 was considered to be significant.

## Results

Of the 354 students that completed the questionnaires, 170(48%) were males and 184(52%) were females. The mean age of the

sample was 21.57 years and its median was  $21 \pm 1.9$  years.

One hundred and forty six (41.24 %) students had used tobacco in some form (smoked or smokeless) in their lifetime. Thirty nine (11.01 %) students were lifetime users of smokeless tobacco of which seven (1.97 %) were current users while 13 (3.67 %) fulfilled the criterion for established users and nineteen (5.36 %) students were occasional users of smokeless tobacco. The frequency and form of smokeless tobacco use is shown in Table 1.

**Table 1.** Pattern of use of smokeless tobacco among colleges' students of Sistan-Balouchestan University-Iran

|                           |             | Frequency | Percentage |
|---------------------------|-------------|-----------|------------|
| Situation                 | Occasional  | 19        | 5.36       |
|                           | Daily       | 7         | 1.98       |
|                           | Established | 13        | 3.67       |
| Kind of smokeless tobacco | Paan        | 27        | 7.63       |
|                           | Nass        | 12        | 3.38       |
| Non smokeless user        |             | 315       | 88.99      |
| Total                     |             | 354       | 100.00     |

Paan (7.63 %) was the most commonly used form of smokeless tobacco followed by Nass (3.38%). About 21 (78%) Paan users belonged to the Engineering College while 7(52%) of Nass users studied in the Psychology College.

About 30(77%) cases of lifetime users also smoked cigarettes while among people who had never used smokeless tobacco, only 12 (30.5%) were smokers (p-value <0.001). The mean age at which the students had begun smoking was  $17.94 \pm 1.64$  years while the mean age at which they had begun using smokeless tobacco was  $18.14 \pm 1.49$  years (p= 0.29).

Lifetime use of smokeless tobacco was also found to have significant associations with student gender (Male > Female, p-value <0.000), student habitat (native > guest, p-value = 0.07) and the kind of College (Engineering > Psychology, p<0.001). The frequency of demographic data in smokeless tobacco lifetime users is shown in Table 2.

Multivariate analysis showed that there was a higher prevalence of smoking among students who were lifetime users versus those who had not used smokeless tobacco (OR: 4.203 [CI95%: 2.279–7.751], p< 0.000). This association was independent of age, gender, habitat (being native) and the kind of college.

Gender was also found to be independently associated with lifetime use of smokeless tobacco. Male students were more likely to be lifetime users than female students. (OR: 2.198 [CI95%: 1.177–4.102],  $p < 0.002$ ).

**Table 2.** Demographic data in lifetime user of smokeless tobacco among colleges' students of Sistan-Balouchestan University-Iran

|         |             | Frequency | Percent |
|---------|-------------|-----------|---------|
| Gender  | Male        | 36        | 10.17   |
|         | Female      | 3         | 0.84    |
|         | Engineering | 16        | 4.52    |
| College | Psychology  | 11        | 3.11    |
|         | Management  | 3         | 0.84    |
|         | Science     | 5         | 1.41    |
|         | Literature  | 4         | 1.13    |
| Habitat | Native      | 29        | 8.19    |
|         | Guest       | 10        | 2.82    |

An independent association was also found between lifetime use of smokeless tobacco and the kind of college. There was a higher prevalence of lifetime users among students of the Engineering College compared to the Psychology College (OR: 2.155 [CI 95%: 1.250–3.716],  $p < 0.008$ ). Results of multivariate analyses are shown in Table 3.

**Table 3.** Predictors of lifetime use of smokeless tobacco among colleges' students of Sistan-Balouchestan University- Iran on multivariate analysis

|                     | OR    | CI 95%        | p-value |
|---------------------|-------|---------------|---------|
| Gender              | 2.198 | 1.77 - 4.102  | 0.002   |
| Location of College | 2.155 | 1.250 - 3.716 | 0.008   |
| Cigarette smoking   | 4.203 | 2.279 - 7.751 | 0.000   |

## Discussion

To the best of our knowledge, this pilot study was the first evaluation of Paan and Nass use in Iran. Almost all studies carried out in Iran, have been focused on the patterns of cigarette smoking alone and not the use of smokeless tobacco. Some studies have been carried out, especially in India and Pakistan about smokeless tobacco because of its common use in those countries, regarding its role in head and neck cancers especially oral cavity and pharynx (25,26,28,36) bladder carcinoma (37) peptic ulcer disease (38) and oral mucosal lesion (25). In these studies the range of lifetime smokeless tobacco users was in the range of 23 to 47 percent (36-40). Understandably, our figure of 11 percent

prevalence is much lower compared to the rates among patients with conditions likely to be the result of long time use of smokeless tobacco.

It was reported in 1982 that 21 percent of Karachi people used Paan and in a recent study (36), 40 percent were reported to use smokeless tobacco. Various studies (40-42) have shown that the use of smokeless tobacco is inversely associated with the level of education. This might explain the lower prevalence reported here because our population was comprised of guest students who were also likely to be more aware of the hazards of smokeless tobacco than others, but it should be mentioned that Sistan-Balouchestan is a boundary state.

Most studies have reported that Paan is the most common form of smokeless tobacco used in India but in Pakistan Nass or Naswar were the more popular choices. Our study found Paan to be the most commonly used among students. More significantly, it was seen that 52 percent of Paan users belonged to the Engineering College. In Sistan-Balouchestan, despite neighboring Pakistan, Paan is a new drug and it is more popular than Nass, especially among educated people and guests. Most guest students were in the Engineering College and the highest mean score of examination were observed in that college. On the other hand, industrially prepared Paan marketed in bright, attractive sachets with appealing brand names like "Sir", "Shahi (royal)", are gaining popularity, especially among the guest students.

We also found an independent association between the use of smokeless tobacco and the kind of college, with students from the Engineering College being more likely to be lifetime users. One explanation of this might be the high tendency of engineering students for courageous and risky behaviors.

Our study also showed a significantly higher prevalence of cigarette smoking among users of smokeless tobacco. This could be due to the same risk factors which probably encourage people to smoke as well as the use of smokeless tobacco. In our study, the mean age at which the students had started smoking was similar to that at which the students had

begun using smokeless tobacco. This means that both habits are acquired at an equal age, again signifying possible similar reasons behind cigarette smoking and the use of smokeless tobacco.

This observation that the use of smokeless tobacco was more common among the males is in line with what was found by Imam et al. (5) and Mazahir et al. (6). We feel that this gender difference is due to this cultural fact in Iran that the use of tobacco (smoke and/or smokeless) remains socially more acceptable for males than females.

There was a significant association between being a native student and using smokeless tobacco and multivariate analysis showed that this was an independent association. In another word, common use of smokeless tobacco in native people of boundary states has widely spread to educated groups.

In conclusion, use of smokeless tobacco by college students should not be ignored considering their future role in communities. Adding the goal of eliminating the use of smokeless tobacco to the existing law against cigarette smoking may be helpful. Similar factors seem to be promoting the use of cigarettes as well as smokeless tobacco. Also, colleges should consider providing greater education about the myths and hazards of smokeless tobacco. Furthermore, boundary states preferences for the smokeless tobacco use should be kept in mind while planning preventive programs in these regions. Law in boundary states has to focus more on eliminating Paan and Nass usage. Further community-based studies are required to highlight the health burden due to smokeless tobacco and to better plan anti-tobacco law in the existing resources of a developing country such as Iran.

In limitations, this study is not the perfect representative of Iranian students' drug abuse situation or condition. We tried to focus our study just on boundary states students from five colleges of Sistan-Balouchestan province in southeastern Iran which is close to Pakistan to estimate the frequency of smokeless tobacco usage.

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