

ORIGINAL RESEARCH

Assessment of Nicotine Dependence in Tobacco Users visiting a Dental College in Bareilly City: A Cross-sectional Study

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ABSTRACT

Introduction: Tobacco is the major preventable cause of death in many parts of the world. In certain cultures, oral tobacco use forms part of the social tradition, and can begin in early childhood. Various studies suggest that nicotine in tobacco leads to addiction. The addicted people, hence, regularly chew or smoke tobacco to keep their levels up and derive pleasure. The aim of this study is to determine and compare the nicotine dependence among the two types of tobacco users – smokers and smokeless tobacco users – and also to find out which age group in the tobacco user population is more dependent on nicotine.

Materials and methods: It was a prospective cross-sectional study. Totally, 300 participants were included who smoke and chew tobacco and reported to the Department of Public Health Dentistry, Institute of Dental Sciences, Bareilly, Uttar Pradesh, India. A revised version of Fagerström Test for Nicotine Dependence (FTND) questionnaire was used. Data were statistically analyzed by using Student's t-test, one-way analysis of variance test.

Results: In smokers, the mean FTND scores were highest among 56 to 75 years age group, whereas in smokeless tobacco users, it was highest among 36 to 55 years age group. There was no significant association between age group and the FTND score. Tobacco and FTND scores showed a highly significant correlation, with p-value of 0.001.

Conclusion: There is a need for a method that records both physical and psychological dependence. The present study shows most of the users were in the age group of 15 to 35 years. This is an alarming situation. Hence, those children ought to be focused to discontinue tobacco therapy, regardless of kind of susceptibility to tobacco utilization.

Key message: Health professionals should be trained to play an active role for behavior change in tobacco users and also strict enforcement of existing strategies.

Keywords: Fagerström questionnaire, Smokeless tobacco, Smokers, Tobacco cessation.

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INTRODUCTION

There is a truism in tobacco control, which states that “No one can do everything but everyone can do something.”
—*Dalai Lama*

Tobacco is the major preventable cause of death in many parts of the world. In developed countries, where the tobacco epidemic took hold much earlier than in the rest of the world, tobacco-related cardiovascular, lung diseases, and cancers cause a significant proportion of total deaths and chronic disability. Current estimates suggest that smoking prematurely kills as many people in the developing as in the developed world. Smokers and other tobacco users start and continue for different reasons. Children and young people can start smoking from curiosity, risk taking, rebellion, parental and sibling smoking, peer pressure, the desire for weight control, the desire to look grown up, and the perception that tobacco use is normal or “cool.”¹

Extensive promotion by the tobacco industry and permissive environments that make tobacco products readily available and affordable play a major role in inducing young people to take up smoking. In certain cultures, oral tobacco use forms part of the social tradition, and can begin in early childhood. While tobacco use is prompted by several different factors, the continuation of tobacco use is largely fueled by addiction. Human and animal studies have shown that nicotine is the substance in tobacco that leads to addiction.

People addicted to tobacco need to smoke or chew tobacco regularly and frequently to keep their nicotine levels up, so that they can feel pleasure and avoid the discomfort of withdrawal. Other factors that reinforce tobacco use include social and psychological pressure, lack of knowledge of the risk to health, and difficulty in quitting. The harmful effects in oral mucosa are staining of teeth and gums, increased risk of periodontal diseases, and bad breath. The acid taste due to smoking often results in aphthous ulcers and even leukoplakia.^{2,3}

The word tobacco is thought to be derived from the Arabic word “Tabaq,” meaning “euphoria producing

herb." Since tobacco is consumed more in the form of smoking than chewing, World Health Organization has predicted that about 1.9 billion people will be smoking by 2025 worldwide; 20% of them being teenagers. About 1 lakh children are taking up addiction every day and 50% of them live in Asia. Rate of smoking has declined in the developed world. However, the tobacco consumption is rising by 3.4% per year since 2002 in the developing world.³

The objective of this study was to determine and compare the nicotine dependence among the two types of tobacco users – smokers and smokeless tobacco users – and also to find out which age group in the tobacco user population is more dependent on nicotine. This study also attempts at creating a new avenue for the tobacco cessation center in Dental College of Bareilly city, Uttar Pradesh, India, where they can target their efforts toward rural population, particularly people aged above 30 years of age with a tobacco smoking habit so that they can actually reduce the burden of number of people at risk for developing tobacco-associated oral cancer.

MATERIALS AND METHODS

Sample size estimation was done by using a formula.

Formula used

The incidence of tobacco users was reported to be 47% (from the study of Manimunda et al⁴) as the incidence and 6% margin of error; the minimum required sample size at 5% level of significance is 300 patients.

$$n = \frac{Z_{\alpha/2}^2 pq}{d^2}$$

p is the observed incidence

$$q = 1 - p$$

d = margin of error

$$p = 0.47$$

$$q = 100 - 47 = 53$$

$Z_{2.5\%} = 1.96$ at 5% level of significance (from standard normal tables)

$$d = 0.06$$

$$\frac{1.96 \times 1.96 \times 0.47 \times 0.53}{(0.06)^2} = \frac{0.95694}{0.0036} = 265.8$$

Approximately, 300 subjects were selected for this study.

This was a questionnaire-based prospective cross-sectional study. Smokers who were visiting the Department of Public Health Dentistry at Institute of Dental Sciences, Bareilly, Uttar Pradesh, India within the age group ranging between 15 and 75 years were selected. The

duration of study was 2 months, i.e., between October and November. The total sample size included 300 patients who had the habit of smoking tobacco and also tobacco chewers and excluded the subjects not willing to participate and did not give informed consent.

The age is divided into following groups:

- Group 1: 15 to 35 years
- Group 2: 36 to 55 years
- Group 3: 56 to 75 years

A standard questionnaire proforma of Fagerström Test for Nicotine Dependence (FTND, revised version) for smoking given by Heatherton et al⁵ and smokeless form of tobacco given by Ebbert et al⁶ was administered to each subject.

These questionnaires were translated in local language for better understanding and effective answering. The questionnaire consisted of 20 questions:

- Questions on dependency of smoking form of tobacco – 6 each
- Questions on dependency of smokeless form of tobacco – 6 each

Each question carried some point/score based on the answer. The subjects were asked to answer the questions as per their experience of smoking and tobacco consumption. The overall score was the summation of scores of all questions. Minimum score was 0 and the maximum score was 10.

Interpretation of Scoring

- 7 to 10: Person is highly dependent on nicotine
- 4 to 6: Person has low to moderate dependence on nicotine
- Below 4: Person has low to moderate addiction

For those patients who were illiterate, questions were read for the patient by the investigator who tried to read all questions in the same manner in order to prevent any discrimination or from guiding the patient to give a particular answer. For each subject, administration of questionnaire was done by the researcher only. The obtained data were coded and entered in Microsoft Excel. Data were statistically analyzed by using Student's t-test, one-way analysis of variance test. Statistical Package for the Social Sciences version 21.0 was used for all the data analysis.

RESULTS

Table 1 shows distribution of study subjects according to age, gender, and type of tobacco consumption (either in the form of smoking or smokeless tobacco form). Out of 300 subjects, 274 were males and 26 were females. There were 174, 110, and 16 subjects under 15 to 35, 36 to 55, and 56 to 75 years age groups respectively, out of

Table 1: Sociodemographic distribution of participants

Variable	n	%
Male	274	91.4
Female	26	8.6
15–35 years	174	58
36–55 years	110	36.7
56–75 years	16	5.4
Smokers	116	38.6
Smokeless tobacco users	184	61.4

which majority of the subjects were from 15 to 35 years age group, followed by 110 and 16 in 36 to 55 years and 56 to 75 years respectively. Majority of the subjects, about 184, were using smokeless tobacco and about 116 were smokers.

Table 2 shows the distribution of various responses using FTND questionnaire among study subjects. Among smokers, 37.3% subjects had smoked the first cigarette after 60 minutes, while in smokeless tobacco users 42.1% subjects placed their first dip within 5 minutes after waking up. In smokers, 65.5% subjects had no difficulty to refrain from smoking where it is banned (e.g., cathedral, library, movies, etc.). Among smokeless tobacco users, 46.4% subjects had intentionally swallowed tobacco juice. In smokers, 59.6% subjects hated to give up morning cigarette, while in smokeless tobacco users 61.6% subjects hated to give up the first morning chew of tobacco.

In smokers, 64.7% subjects smoked 0 to 10 cigarettes per day, whereas about 47.5% subjects use more than three can/pouches per week among smokeless tobacco users. Among smokers, 72.8% subjects smoked frequently during rest of the day, instead of first hour after waking, while in smokeless tobacco users, 54.8% subjects chewed tobacco more frequently during rest of the day compared with first hour after waking. In smokers group, 65.7% subjects did not smoke when they were so ill that they were in bed most of the day, whereas in smokeless tobacco users, 65.8% subjects did not chew tobacco when they were so ill that they were in bed most of the day.

Table 3 shows distribution of mean FTND scores according to age group among tobacco users. In smokers, the mean FTND scores were highest among 56 to 75 years age group, whereas among smokeless tobacco users, mean FTND scores was highest among 36 to 55 years age group. There was no significant association found between age group and the FTND score.

Table 4 depicts distribution of mean FTND scores among tobacco users. The form of tobacco and FTND scores showed a highly significant correlation, with p-value 0.001 and t-value 4.763, which indicates that tobacco consumption caused nicotine dependence.

DISCUSSION

Tobacco use is a serious public health challenge globally. It has assumed the dimension of an epidemic, resulting in enormous disability, disease, and death. It is estimated that 5.4 million preventable deaths occur globally every year attributable to tobacco smoking, 70% of which is in developing countries and more than 600,000 people die annually from second-hand smoke. Thus, tobacco kills over 2,200 people every day. At this rate, it is expected to double by 2020. In addition to damage to personal health, tobacco use results in severe societal costs like reduced productivity, health care burden, environmental damage, and poverty of the families.⁷

In a study conducted by Soni Preeti and Raut,⁸ it was found that children in a large study in Uttar Pradesh were impressed by advertising depicting a high lifestyle, which included smoking, drinking, good clothes, and affluent surroundings. Other important reasons for starting (and/or using) tobacco among youth were warm feeling of sharing among friends, fun/enjoyment, or to remove boredom and to pass time. Some young smokers said they smoked to relieve feelings of anxiety/stress/failure.

The desire to enhance one's image, adding to one's status, appearing grown up or macho were reasons cited by many. Working children stated necessity to keep awake

Table 2: Responses of participants to FTND

Sl. no.	Questions	Smokers (%) (n = 116)	Smokeless tobacco chewers (%) (n = 184)
1	How soon after wake up do you smoke your first cigarette/ first dip?	37.3% (after 60 minutes)	42.1% (after 60 minutes)
2	Do you find it difficult to refrain from smoking/chew in places where it is forbidden like church, school, library, etc.?	65.5% (no)	46.4% (always)
3	Which cigarette would you hate to give up/chew or would you hate to give up most?	59.6% (first one in the morning)	61.6% (first one in the morning)
4	How many cigarette or pouches per day?	64.7% (10 or less)	47.5% (more than three pouches)
5	Do you smoke/chew more frequently during the first hours after waking than during the rest of the day?	72.8% (no)	54.8% (yes)
6	Do you even smoke/chew even if you are sick in bed most of the day?	65.7% (no)	65.8% (no)

p < 0.005 (statistically significant)

Table 3: Comparison of mean FTND scores among smokers and smokeless tobacco users across age group

Sl. no.	Age groups	Subjects	Mean \pm SD	F-value	p-value
Smokers					
1	15–35 years	80	4.64 \pm 2.45	0.886	0.415
2	36–55 years	31	3.75 \pm 2.09		
3	56–75 years	05	4.80 \pm 2.48		
Smokeless tobacco users					
1	15–35 years	104	4.62 \pm 2.64	0.439	0.64
2	36–55 years	168	4.86 \pm 2.61		
3	56–75 years	08	3.50 \pm 2.13		

SD: Standard deviation

as a prominent reason. Children generally started with experimentation and occasional use, but with appearance of withdrawal symptoms, addiction soon took over. Forcing by friends or relatives, a direct form of peer pressure, and parental smoking are often quoted reasons for young taking up the habit. Use of tobacco is progressively increasing among adolescents.^{8,9}

In the present study, 91.4% of the tobacco users were males, while 8.6% were females, which are similar to the studies conducted by Pallavi et al.¹⁰ Overall, prevalence of smoking and smokeless tobacco users among female population was low compared with males. Similar results were found in the present study wherein 91.4% of the tobacco users were males, while 8.6% were females. Out of this, 38.6% were smokers and 61.4% were having a habit of smokeless tobacco. The present study results revealed that tobacco users irrespective of the form of tobacco, were common in the age group of 15 to 35 years. Smokeless tobacco users were more than the smokers. A study was conducted by Kishore et al¹¹ in a rural population of the district of Wardha. The authors found that majority of the boys were engaged in tobacco chewing (69.74%), while in the present study, 61.4% had tobacco chewing habit.

According to a study conducted by Jayakrishnan et al,¹ nicotine dependence among smokers in a selected rural population in Kerala, India, it was found that FTND scores increased with age. On the contrary, the present study did not reveal a significant association between age groups and FTND score.

Duration of habit was not considered in the present study, which is a factor in relation to tobacco consumption habit. The FTND questionnaire records only physical dependence only, which is a narrow aspect of dependence.

Table 4: Comparison of mean FTND scores between smokers and tobacco chewers

Sl. no.	Form of tobacco	Participants	Mean \pm SD	t-test	p-value
1	Smokers	116	3.86 \pm 2.21	4.763	0.001
2	Smokeless tobacco	184	4.72 \pm 2.87		

SD: Standard deviation; p < 0.05 statistically significant

So, there is a need for a method that records both physical and psychological dependence.

The present study shows most of the users were in the age group of 15 to 35 years. This is an alarming situation. Hence, those children ought to be focused to tobacco discontinuance therapy, regardless of the kind of susceptibility to tobacco utilization.

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