Prevalence and correlates of nicotine dependence among the construction site workers at IGIMS, Patna

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ABSTRACT

Introduction: Nicotine dependence has increased over the years and so has the prevalence of smokeless tobacco use. If the dependence is increasing, we must look for newer tobacco cessation strategies and implemented them. Tobacco causes premature deaths and nicotine dependence has both psychological and physical dependence. Method: The study was planned and an interview was conducted to collect the sociodemographic details, tobacco, and fagerstrom nicotine dependence scale - smokeless tobacco (FTND-ST) for nicotine dependence. The questionnaire was adopted from the WHO questionnaire and a pre-tested, predesigned, semi-structured questionnaire was used. Result: About almost half of the population is dependent on nicotine (51.6%). Daily smokeless tobacco users who are married and have a tobacco user in the family are mostly dependent on smokeless tobacco. Severity of smokeless tobacco dependence for nicotine dependence among smokeless tobacco users were associated with low academic achievement, increased awareness of side effects, and increase in duration and frequency of use. Conclusion: Nicotine dependence has increased despite efforts in the field in the recent years. Therefore, we need to have a mechanism for combining behavioral therapy and pharmacotherapy that may increase smoking cessation rates.

Keywords: Construction site workers, nicotine dependence, smokeless, tobacco
With growing urbanization and industrialization, the construction industry is visualized as an important player in economic growth. One of the menaces that affects the health of construction labourers is tobacco, which imposes an economic burden due to increased absenteeism and reduced productivity.\(^8\) The construction industry, being an unorganized sector, are not covered by any health insurance nor any non-profit organizations or agencies. Absence of social security can lead to exploitation of their health needs and health seeking behaviors. Overall, they contribute to tobacco prevalence and this problem persists in these small pockets due to knowledge gaps in product characteristics, and lack of surveillance. This has led to flourishing of tobacco use under policy discrepancies. National level surveys that document tobacco prevalence fail to provide us details on nicotine dependence.\(^8,9\) In this setting, this study was conducted among construction site workers to find out the factors responsible for continuation of the product and the implementation of a tobacco cessation program.

**Objectives**

1. To study the prevalence of nicotine dependence among construction site workers using smokeless tobacco.
2. To study the correlates of nicotine dependence among the construction site workers at IGIMS, Patna

**Methodology**

A community-based, cross-sectional, and observational study was conducted in the premises of IGIMS between January 2018 and March 2019 after taking permission from the institutional ethics committee. Oral informed consent was taken from the participants. All the construction site workers at IGIMS, Patna, who were present on the day of data collection were interviewed. A total of 172 interviews were conducted in the breaks and a maximum of 5 interviews were conducted in a day. A predesigned, pre-tested, semi-structured schedule was used for collection of data.

**Study tool**

Data was collected by face-to-face interview method using WHO adopted pre-tested semi-structured questionnaire\(^10\) consisting of questions pertaining to sociodemographic details and smokeless tobacco use. A pre-tested structured questionnaire was developed after referring to the Global Adult Tobacco Survey version 2.1, June 2014. The questionnaire consisted of three sections: 1) Sociodemographic profile: questions on age, sex, education, occupation, income, marital status, and migrant status with duration; 2) Smokeless tobacco use, different form in which it is used, current and former tobacco user, frequency of use, age of initiation, and nicotine dependence; 3) Awareness of health effects of smokeless tobacco, knowledge about the laws for smokeless tobacco. Nicotine dependence will be assessed using Fagerstrom test, a validated questionnaire for nicotine dependence for smokeless tobacco.\(^12-3\) It helps in assessing the intensity of physical dependence on nicotine. It contains the following six standard questions of the fagerstrom nicotine dependence scale - smokeless tobacco (FTND-ST). Translation of the FTND was done in Hindi along with back translation. Cigarettes, beedi, and other smoking products were not included in the questionnaire as they are banned at the work place so workers were not comfortable in reporting about the same. They were only willing to share information regarding, smokeless products such as khaini and gutka. Khaini is defined as smokeless tobacco products including chewing tobacco and moist/dry snuff. Low, medium, and high levels of nicotine dependence was defined as FTND score was <4, 4–6, and >6, respectively.\(^8,9\) Betel quid and areca nut use was also not enquired separately as they were not used during the office hours.

**Data collection**

After permission from the supervisors of the study population, workers were contacted to participate, and purpose of the study was explained to eligible participants. Interviews were conducted in Hindi and in the participant’s local language (whichever convenient to the participants) by the principal investigator, field staff, and trained interns from IGIMS, Patna. Personal face-to-face interviews were conducted with the construction site workers working in the college premises. The questionnaire was checked at the end for completeness. After the interviews, a day was fixed in a week during free time after consulting the supervisors and a group health education session was conducted with audio visual aids to generate awareness on the harmful effects of tobacco; they were encouraged to quit the usage of tobacco, informing them of the various cessation strategies.

**Operational definition**

The current smokeless tobacco users were defined as people either chewing at the time of the study or had chewed tobacco more than 20 times in their lifetime.\(^13\) Smokeless tobacco products include khaini and gutka, as it was the only form reported to be used. To determine the correlates of nicotine dependence, the participants were categorized as low, medium, and high levels of nicotine dependence according to an FTND score of < 4, 4–6, and >6, respectively.\(^14\)

**Data and Statistical analysis**

The quantitative data was entered into a Microsoft Excel sheet and analyzed using SPSS software version 16.0 (Statistical Package for the Social Sciences Inc, Chicago, IL, USA) after completion of the survey. Descriptive statistics like mean, median, proportion, standard deviation, and the interquartile range were computed. Chi-squared and Fisher’s exact test was used to evaluate the associations among smokeless tobacco use, and the sociodemographic variables. The relationship of nicotine dependence after categorization of dependence into mild, moderate and severe, and sociodemographic variables were also computed via Pearson Chi-squared (\(\chi^2\)) test and \(P < 0.05\) was taken as those with a significant association.
Ethical justification

Necessary permission to conduct the study was obtained from the supervisors of the construction site workers. Investigator and supervisors were aware of the ethics in biomedical research policy of ICMR (2006) and the Declaration of Helsinki revised in 2002. Ethical clearance was sought from the institutional ethical committee for biomedical research. (Letter no. IEC/ IGIMS/2020/818 dated 8.4.2019)

Result

Table 1 shows the total number of construction site workers who are dependent on nicotine. About almost half of the workers (51.6%) were dependent on nicotine. Mostly 96.5% of the workers (166) were males. The mean age of the study population was 27 ± 10.40 years with the majority (80.8%) being between 18–40 years of age. Table 1 also describes the association between the risk factor and daily smokeless prevalence and nicotine dependence. Married workers and those consuming smokeless tobacco daily were dependent on tobacco. Presence of tobacco use in the families of these workers was also associated with smokeless tobacco use.

Table 2 shows associated risk factors with degree of nicotine dependence among smokeless tobacco users. The median FTND score was 4.27 with interquartile of 2.38 (25%) and 6.60 (75%).

Table 1: Distribution of study population according to dependence on smokeless tobacco and different variables (n = 172)

| Variable                        | Smokeless tobacco use | Total (n = 172) | P    |
|---------------------------------|-----------------------|----------------|------|
|                                 | Yes (%)               | No (%)         |      |
| Age (years)                     |                       |                |      |
| <20                             | 17 (19.3)             | 19 (22.6)      | 36 (21) |
| 21–29                           | 25 (28.4)             | 38 (45.2)      | 63 (36.6) 0.092 |
| 30–39                           | 24 (27.3)             | 16 (18.2)      | 40 (23.2) |
| 40–49                           | 15 (17)               | 8 (9.5)        | 23 (13.4) |
| >50                             | 7 (8)                 | 3 (3.5)        | 10 (5.8) |
| Education                       |                       |                |      |
| Illiterate/Literate             | 23 (26.1)             | 18 (21.4)      | 41 (23.8) 0.139 |
| Up to primary                   | 19 (21.5)             | 14 (16.6)      | 33 (19.2) |
| Middle and secondary            | 32 (36.3)             | 26 (31)        | 58 (33.7) |
| Senior secondary and above      | 14 (16.1)             | 26 (31)        | 40 (23.3) |
| Marital Status                  |                       |                |      |
| Married                         | 68 (77.2)             | 52 (62)        | 120 (70) 0.021 |
| Unmarried/Separated             | 20 (22.8)             | 32 (38)        | 52 (30) |
| Migrant                         |                       |                |      |
| Yes                             | 69 (78.4)             | 50 (59.5)      | 119 (69) 0.08 |
| No                              | 19 (21.6)             | 34 (38.5)      | 53 (31) |
| Income                          |                       |                |      |
| <10000                          | 49 (55.6)             | 40 (47.6)      | 89 (51.7) 0.291 |
| >10000                          | 39 (44.4)             | 44 (52.4)      | 83 (48.3) |
| Use of tobacco in family member |                       |                |      |
| Yes                             | 52 (59)               | 34 (40.4)      | 86 (50) 0.014 |
| No                              | 36 (41)               | 50 (59.6)      | 86 (50) |

Nicotine dependence among smokeless tobacco users were associated with low academic achievement and younger age of initiation. Overall, no significant association was observed for age and gender, but confidence intervals are wide.

Of the 88 tobacco users, a majority (94.5%) were in the age group between 21 and 39 years, with the majority education being middle to secondary. A total of 34 tobacco users (38.63%) belonged to low nicotine dependence group, but 21 (23.86%) were highly dependent on nicotine. The mean FTND score of all tobacco users was 4.75 ± 2.57. High nicotine dependence was maximally observed among educated to middle to secondary level (37.9%), with frequency greater than 5 per day with duration greater than 5 years, not aware of the injurious effect of tobacco (95.1%), and using tobacco for ≥5 years (95.1%) and place of tobacco use mostly being the work place. The variation of score observed between different groups was statistically significant [Table 2].

Discussion

In high-burden countries, SLT use needs to be regulated through comprehensive implementation of the World Health Organization’s (WHO) Framework Convention for Tobacco Control (FCTC). SLT use is prevalent in the state with majority of the product in this category being khaini and gutka. The prevalence of smokeless tobacco users among construction site workers is 51%, comparable to a study from Chennai[9] and lower to that of Nepal where it is 80%.[9]

Marital status and use of tobacco by family members is significantly associated with the use of smokeless tobacco. We found that 38.63%, 37.5%, and 23.86% of smokeless tobacco users belonged to low, medium, and high dependence groups, respectively. Smokeless tobacco users in the family and married workers were associated with increased use of smokeless tobacco. Environmental (working conditions) and individual factors contribute to daily tobacco use and nicotine dependence.

In our study we observed that FTND score had no relation with age. Scores are higher with low educational level; a similar finding was reported in a study from West Bengal.[18] Decrease in the score is associated with increase in level of education. High score in nicotine dependence is associated with—not being aware of the side effects of tobacco use—increased frequency and longer duration of use.[17,18] Place of using tobacco also has a greater influence on nicotine dependence, with a higher score associated with the place of work.

The construction site workers are susceptible to daily use of smokeless tobacco. The role of the institution, supervisors and peers should be emphasized at an early stage to provide help in quitting and halting disease progression.

In a recent policy review of 180 countries that are signatories to WHO FCTC, we found that only a handful of countries have addressed SLT control at par with cigarettes.[19] The regulatory bar
is often much lower for SLT than cigarettes.\(^{[24]}\) Where SLT control policies are present, there are gaps in their enforcement.\(^{[21]}\) There are also evidences that very few cigarette smokers transition to smokeless tobacco use, and among those who do, dual use is more common than exclusive smokeless tobacco use.\(^{[22]}\) So bans that are implemented differentially has not led to increase in smokeless tobacco use due to laxity in ban on the same. While our disease risk estimates are based on limited evidence of modest quality, the likely ST-related disease.

**Conclusion**

Tobacco is a dual problem, both physiological and behavioral: Firstly, due to the effects that nicotine dependence has on
our body, and secondly, due to the habit which when formed is difficult to get rid of and may result in premature death. Therefore, treatment modality must focus on both of these domains (counselling and pharmacotherapy) for successful recovery and to take care of relapses that occur, and the treatment should be cost effective as well.

Identifying the determinants of tobacco use will help in determining a suitable plan for cessation of tobacco use. Nicotine replacement therapies at an affordable cost in the public sector should be identified. Mechanisms to incorporate behavioral counselling as a part of routine counselling should be developed in outpatient departments (OPDs) and ensure availability for the same as various barriers like lack of time, organizational problems, and lack of training have been identified as constraints in low resource settings.[25] Tobacco dependence treatments are effective and should be offered in multiple settings (both general and specialized, and both urban and rural) as a routine healthcare practice.

Health needs and literacy on harm reduction catering to the needs of SLT users should be addressed. In a busy OPD, it is very difficult to provide the same until the physician is self-motivated. There should be tobacco cessation centers along with trained counsellors. It is high time that we must opt for community level interventions and non-specialized care for enhancing tobacco cessation services. A community-centered mass approach with minimum sustained intervention is more effective than a client-centered individual approach.[26] The role of treatment is to stop the vicious cycle of SLT and identify treatment gaps and select treatment therapies according to the individual’s need. Behavioral support intervention leading to successful quitting (BISCA) and boost client satisfaction and self-efficacy.[27] To address these, Customization, Acquire resources, Train and build capacity, Create enabling environment, Harness support (CATCH) approach, proposed for the southeast should be followed, components of which include customization according to the needs of the region (adopt the global best practices in smoking cessation to suit), acquire resources and divert them toward cessation activities or create active demands, train and build capacities of professionals and workers, and make it an essential part of routine counselling, create an enabling environment (marketing of the cessation strategies), harness support from all stakeholders (collaborative effort of all the department and extended outreach to the marginalized population).[28]

Apart from these, we should also have an add-on mechanism for generating awareness apart from the existing quitlines/helplines. Researchers in Turkey have shown that WhatsApp support embedded in cessation service delivery has helped in maintenance of quitting rate and has had favorable effects on follow-up.[29] Thus, we propose social media platforms or inbuilt apps in phones to set reminders that can assist in quitting. Higher prevalence of tobacco in the study may be due to various factors unique to the population. Causal relationships cannot be established. Mental status of the individual has not been studied. Research to understand the mechanism of betel quid and areca nut use is needed so as to include in advanced prevention and cessation programs. The sample size of the current study may appear small without any representation of rural areas. Still, it was planned to draw an attention to this sector as SLT bans are still not effectively implemented and workers tend to escape the supervisor, perpetuating continued SLT use, thereby posing a threat to them and to society as well. Details of smoking cannot be recorded as smoking bans at work place push employees to shift their smoking habits to during their spare time.

Key messages
Prioritizing cessation will require strengthening of the health system and awareness of the ill effects of tobacco.

Sharing of globally accepted good practices and collaborating with concerned stakeholders within the existing health care system must be done so that it is sustainable.

Tobacco (SLT) cessation initiatives ought to take into account a complex set of factors in the region such as culture, religion, gender, age, educational and socioeconomic status.

Non-specialized care along with use of social media in designing quit apps will reduce the burden on the health care system.

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Conflicts of interest
There are no conflicts of interest.

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