Predictors of intention to quit tobacco among construction site workers in Delhi, India

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ABSTRACT

Background: Information on predictors of quitting behavior among construction site tobacco users is scarce in India. Hence, this study was conducted to assess the intention of tobacco users toward quitting and its predictors with reference to sociodemographic profile.

Methodology: A community-based, observational study was conducted on adult 172 construction site workers in a university campus of Delhi. Data were collected by an interview using the WHO-adopted, pretested, semi-structured questionnaire. Chi-square test was used for univariate analysis. Pearson’s correlation coefficient and multivariate logistic regression model were used to identify the predictors.

Results: Of the 172 users, 73% had intention to quit. More than half of smokers (56.5%) and 81% of smokeless tobacco users intended to quit. Majority of the tobacco users who intended to quit were literate (75.0%), started tobacco use >15 years of age (75.4%), occasional tobacco users (78.9%), and less dependent on nicotine (74.4%).

Conclusions: Suitable plan for quitting keeping in mind this vulnerable group of workers should be developed depending on the literacy, type of tobacco used, and nicotine dependency.

Key words: Construction workers, intention to quit, tobacco

INTRODUCTION

Tobacco use is currently one of the leading causes of preventable deaths in the world. It is a risk factor for six of the eight leading causes of death in the world. It has almost been 50 years since when India is fighting the battle with tobacco. Although initiatives for all forms of tobacco cessation have increased with time, the menace of tobacco problem still remains a cause of concern globally. India accounts for approximately one-sixth of the world’s tobacco-related deaths. Global Adult Tobacco Survey (GATS), 2010 estimated more than one-third of adults (35%) in the country use tobacco. As per the WHO Global Report on “Tobacco-Attributable Mortality” 2012, 7% of all deaths (for ages 30 and over) in India are attributable to tobacco.

With growing urbanization and industrialization, the workforce has also increased. Construction workers are the pillars of Indian economy, and morbidity due to a preventable factor can have a lethal outcome on these workers, further dwindling the economy. Tobacco use also imposes an economic burden in the form of increased medical costs and from lost productivity.

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Conclusions: Suitable plan for quitting keeping in mind this vulnerable group of workers should be developed depending on the literacy, type of tobacco used, and nicotine dependency.
The government has already engaged in strengthening its tobacco control measures, leading to the accelerated implementation of the WHO Framework Convention on Tobacco Control, which would enable them to reach the target of 30% relative reduction in the prevalence of current tobacco use.[5] The policy level interventions need to reach the vulnerable groups, which still is in its inception stage. Different studies identified age, sex, ethnicity, education, age at initiation of smoking and nicotine dependence as important predictors of quitting in general population.[6,7] However, this section of society has not been studied upon. The present study was conducted to assess the prevalence of quitting rate and correlates of quitting behavior among the construction site workers.

**METHODOLOGY**

**Study design and study setting**
A cross-sectional study was conducted among all construction site workers aged 18 years and above in the campus of Hamdard Institute of Medical Sciences and Research and Associated HAH Centenary Hospital, New Delhi. For the purpose of the study, 175 workers were approached, of which 172 consented and met the inclusion criteria were included in the study for 6 months (September 2014–March 2015).

**Inclusion criteria**
All adult (18 years and above) payroll workers of construction site who were willing to participate were included in the study.

**Exclusion criteria**
Workers who were mentally challenged if any were excluded from the study.

**Ethical clearance permission**
Necessary permission to conduct the study was obtained from the concerned authority of the construction site. Ethical approval was sought from Institute’s Ethical Committee. Written informed consent was obtained from the respondents after explaining the nature and objectives of the study in their local language.

**Study tools**
Data were collected by a face-to-face interview method using the WHO-adopted, pretested, semi-structured questionnaire having questions pertaining to sociodemographic details. Nicotine dependence was assessed using Fagerstrom test, a validated questionnaire for nicotine dependence.[8,10] The semi-structured questionnaire included three sections as follows.

**Demographic profile**
It contained information on age, education, income per month, type of family, parental history of tobacco use, and history of migration from other state.

**Quitting behavior**
It contained information about attitude toward quitting and practice of workers regarding tobacco (type of tobacco use, age of tobacco use initiation, frequency of tobacco use, number of cigarettes/bidi smoked, and past attempts to quit).

**Method of data collection**
Data were collected by the face-to-face interview method. The questionnaire was anonymous, and anonymity had been maintained. First, we contacted contractor at construction units for the permission to conduct the survey on their premises. Upon receipt of this permission, we then contacted recognized group “leaders” who mobilized and encouraged their coworkers to participate in the study. The study purpose was explained to all eligible participants, and verbal consent was obtained from all who elected to participate. Questionnaires were checked by the investigators for completeness. Following completion, all participants were given a token of appreciation (free medicines if required) and counseling in tobacco cessation clinic. They were referred to appropriate department for medical advice if needed.

**Operational definition**
Following terms were used for data collection.

**Current tobacco users**
Use tobacco every day for within 1 month before survey.

**Nontobacco users**
Never use tobacco or occasionally use tobacco.

**Desire to quit**
Current tobacco users were asked whether they had any plan or intention to quit smoking or smokeless tobacco use in the year following the study.

**Statistical analysis**
The data were analyzed using IBM SPSS 22.0. IBM Corp., Armonk, NY, USA. Chi-square test was used to evaluate the associations among nicotine dependence and the sociodemographic variables. For analysis, the nicotine dependence was divided into two groups; the participants with moderate to severe dependence as per the score were considered as highly dependents and those falling into the mild category with scores 0–3 were considered as mild dependents. Degree and direction of relationship between dependent and independent variables were computed by Pearson’s product moment correlation coefficient ($r$). The variables from univariate analysis were further assessed by multiple logistic regression analyses model using intention to quit (yes [0]/no [1]), as the outcome/dependent variable to identify the predictors of quitting behavior. $P < 0.05$ was considered statistically significant.
RESULTS

All male construction site workers in this study reported 90.6% (156/172) of tobacco use. The mean age of construction site workers was 32.04 (standard deviation ± 11.6) years. Smokeless form of tobacco was used in majority (49%), 29% smoked bidi/cigarette, and 22% were dual users. Around 73% (114/156) of the tobacco users wanted to quit tobacco in the near future. Among those who intended to quit, half of them were planning in the next 30 days (49.1%) and 33.3% in the next 1 year.

Intention to quit was higher among 18–45 years of age group (68%) and among those who initiated tobacco use after 15 years of age (75%). Probably, early initiators have high dependence and find it difficult to quit. Higher household income per month (>10000 INR) (75%), migrants from other states (68%), those whose either parents consumed tobacco (72.7%), and those who were living in a joint family (83%) also had higher intention to quit. The intention was stronger among those consuming tobacco “occasionally” (78.9%) as compared to 67.5% daily users. A significantly higher proportion of smokeless tobacco users (81.6%) intended to quit as compared to 56.5% of smokers ($P = 0.01$). The quitting intention was high among those minimally dependent on tobacco (low Fagerstrom Test of Nicotine Dependence score) (74.4%) as compared to highly dependents (67.7%). Three-fourths (75%) of the literate workers were thinking to quit tobacco as compared to 55.3% illiterate workers ($P = 0.01$) [Table 1].

In the current study, 5.5% of smokeless tobacco users and 5% of smokers had already quit tobacco. On exploring the reasons of quitting tobacco among those who had already quit ($n = 10$), health concerns and family pressure were cited as the most common. Among smokeless tobacco users, those intending to quit cited money concerns (26.1%), family pressure (19.3%), and health concerns (19.3%) as major reasons to desire to quit. Dual responses such as health concern and family pressure (13.6%) were also reported. Among smokers, around one-fourth (25%) reported family pressure and health concern both as a reason to quit. Money concerns and family pressure individually were cited by 23.0% and 21.2%, respectively [Table 2].

A statistically significant weakly positive correlation ($r = 0.17, P = 0.03$) was observed between education level attained and intention to quit. With increasing age ($r = -0.04, P = 0.63$) and higher nicotine dependence ($r = -0.15, P = 0.06$), the intention to quit became weaker. Higher age of initiation of both forms of tobacco was observed to be a positive predictor of intention to quit, of which statistically significant moderate positive correlation was observed between age of initiation of smokeless tobacco and intention to quit ($r = 0.37, P = 0.00$) [Table 3].

| Variables | Intention to quit tobacco | Total | $P$ |
|-----------|---------------------------|-------|-----|
| Age (years) | | | |
| 18-30 | 64 (69.6) | 28 (30.4) | 92 (100) | 0.40 |
| 31-45 | 38 (65.5) | 20 (34.5) | 58 (100) | 0.15 |
| 46-60 | 12 (54.5) | 10 (45.5) | 22 (100) | 0.09 |
| Age of initiation of tobacco (years) | | | |
| ≤15 | 16 (61.5) | 10 (38.5) | 26 (100) | 0.15 |
| >15 | 98 (75.4) | 32 (24.6) | 130 (100) | 0.01 |
| Habit of using tobacco | | | |
| Daily | 54 (67.5) | 26 (32.5) | 80 (100) | 0.15 |
| Occasional | 60 (78.9) | 16 (21.1) | 76 (100) | 0.01 |
| Type of tobacco | | | |
| Smokeless tobacco | 62 (81.6) | 14 (18.4) | 76 (100) | 0.01 |
| Smoked tobacco | 26 (56.5) | 20 (43.5) | 46 (100) | 0.03 |
| Both | 26 (76.5) | 8 (23.5) | 34 (100) | 0.21 |
| FTND score | | | |
| Low (0-6) | 93 (74.4) | 32 (25.6) | 125 (100) | 0.50 |
| High (7-10) | 21 (67.7) | 10 (32.3) | 31 (100) | 0.17 |
| Literacy level | | | |
| Illiterate | 42 (55.3) | 34 (44.7) | 76 (100) | 0.01 |
| Literate | 72 (75.0) | 24 (25.0) | 96 (100) | 0.03 |
| Income (INR) | | | |
| <5000 | 80 (64.5) | 44 (35.5) | 124 (100) | 0.51 |
| 5000-10,000 | 10 (62.5) | 6 (37.5) | 16 (100) | 0.32 |
| >10,000 | 24 (75.0) | 8 (25.0) | 32 (100) | 0.32 |
| Type of family | | | |
| Nuclear | 104 (65.0) | 56 (35.0) | 160 (100) | 0.34 |
| Joint | 10 (83.3) | 2 (16.7) | 12 (100) | 0.30 |
| Migrant | | | |
| Yes | 110 (67.9) | 52 (32.1) | 162 (100) | 0.09 |
| No | 4 (40.0) | 6 (60.0) | 10 (100) | 0.21 |
| Parental tobacco use | | | |
| Yes | 64 (72.7) | 24 (27.3) | 88 (100) | 0.08 |
| No | 50 (59.5) | 34 (40.5) | 84 (100) | 0.03 |

DISCUSSION

The present facility-based analysis aimed to study factors predicting intention to quit tobacco among construction site workers. More than 70% tobacco users intended to quit which was higher when compared to the GATS India, in which about 50% tobacco users intended to quit.[4] This was also higher than other Asian countries such as Malaysia (57.8%) and Thailand (40.2%) but comparable to developed countries in the West (65%–81%).[4,11] A similar study among migrant construction workers in Mysore reported a lower prevalence (46%) of desire to quit. One possible reason is...
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As per the GATS, India (2009–2010) survey, 38% of smokers and 35% of smokeless tobacco users attempted to quit in the last 12-month period before the survey. GATS reported around 12% of smokers and 15% of smokeless tobacco users’ intention to quit tobacco in the next 1 month, following the GATS survey. In our study, we observed 32.5% tobacco users intending to quit in next 30 days, of which 44.7% were smokeless users, 17.4% smokers, and 41.2% dual users. Imtiaz et al. have reported a higher proportion of smokers (54.3%) intending to quit as compared to smokeless tobacco users (34.6%). Our findings were comparable with regards to smokeless tobacco users (46%) with GATS - India survey (2009–2010), but the intention to quit was low among smokers in our study in comparison to GATS - India (47%).

Intention to quit was reported to be higher among younger age group, residing in joint family, literates, those with higher household income, late initiators, occasional users, and minimal to moderate level of dependence. Similar findings were reported from tobacco users of other Indian and South Asian countries.

International Tobacco Policy Survey of two states (Bihar and Maharashtra) of India reported that around half of smokeless tobacco users did not intend to quit. In our study, the regression analysis yielded that smokeless users had 63% less intention to quit (OR; 95% CI: 0.37 [0.13–1.11]). In contrast to the findings of our study, another Indian study reported that users of smokeless tobacco were more likely to depict an intention to quit. In the current study, the proportion of smokeless users intending to quit was high (82%), but after adjusting for confounders, the odds to quit reversed. In consideration of the high burden of smokeless tobacco in India, it is important to focus the awareness programs and messages on this type of tobacco being used. There is also need to evaluate the implementation status and effectiveness of these tobacco control policies and programs to understand their effect on tobacco cessation.

As the level of nicotine dependence increased, the intention to quit decreased; however, no significant association was observed between dependence and intention to quit. This has also been demonstrated among other study by Panda et al.; however, significant association has also been demonstrated in other studies.

Literacy is a significant predictor in the current study toward quitting; 75% of literate tobacco users had intentions to

Table 2: Reasons for wanting to quit

| Tobacco users, n (%) | Smokers, n (%) | Dual form, n (%) |
|----------------------|---------------|-----------------|
| Health concerns      | 4 (66.7)      | 0               | 0               |
| Family pressure      | 2 (33.3)      | 0               | 0               |
| Health and family concerns | 0        | 4 (100)         | 0               |
| Total                | 6 (100)       | 4 (100)         | 0               |

Table 3: Correlation between predictors and intention to quit among tobacco users

| Variables                        | Intention to quit | Correlation coefficient (r) | P      |
|----------------------------------|-------------------|-----------------------------|--------|
| Age                              | −0.04             | 0.63                        |        |
| Education level                  | 0.17              | 0.03                        |        |
| Income                           | 0.08              | 0.31                        |        |
| Age of initiation of smoked tobacco | 0.14            | 0.06                        |        |
| Age of initiation of smokeless tobacco | 0.37            | 0.001                       |        |
| FTND score                       | −0.15             | 0.06                        |        |

FTND – Fagerstrom Test for Nicotine Dependence

could be a higher proportion of illiterates (63%) in the study population of Amrutha et al., as compared to our study where only 44% were illiterate. Education is an important factor to be considered in any tobacco control program. This can often be attributed to less knowledge and awareness among the uneducated people. Islam et al., Imtiaz et al., and Surani et al., in their analysis reported around 60%, 47%, and 33% tobacco users of a slum of West Bengal, rural Uttarakhand, rural Bihar, and Maharashtra, respectively, have intended to quit. A weaker intention to quit has been attributed to location of residence; residents of rural area generally tend to report a lower intention to quit. Rural residents are noted and related to a lack of cessation programs, infrequent physician visits, and fewer smoking restrictions making it difficult to break this social norm.

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Table 4: Multiple logistic regression determining predictors of intention of quitting among the adult tobacco users

| Variables                     | P      | Adjusted OR | 95% CI           |
|-------------------------------|--------|-------------|------------------|
| Age (years)                   | 0.54   | 1.01        | 0.98-1.05        |
| Parental tobacco use          |        |             |                  |
| No                            | 0.28   | 1.70        | 0.65-4.44        |
| Yes                           | Reference |          |                  |
| Type of family                |        |             |                  |
| Nuclear                       | 0.93   | 1.09        | 0.18-6.50        |
| Joint                         | Reference |          |                  |
| Literacy status               |        |             |                  |
| Illiterate                    | 0.03   | 0.32        | 0.11-0.89        |
| Literate                      | Reference |          |                  |
| Income per month (INR)        |        |             |                  |
| <5000                         | 0.34   | 0.45        | 0.09-2.34        |
| 5000-10,000                   | 0.09   | 0.18        | 0.03-1.27        |
| >10,000                       | Reference |          |                  |
| Age of initiation of tobacco  |        |             |                  |
| ≤15                           | 0.95   | 0.96        | 0.30-3.08        |
| >15                           | Reference |          |                  |
| Habit of using tobacco        |        |             |                  |
| Daily                         | 0.71   | 0.83        | 0.31-2.24        |
| Occasional                    | Reference |          |                  |
| Type of tobacco               |        |             |                  |
| Smokeless tobacco             | 0.08   | 0.37        | 0.13-1.11        |
| Smoked tobacco                | 0.74   | 1.24        | 0.35-4.36        |
| Both                          | Reference |          |                  |
| FTND score                    |        |             |                  |
| Low                           | 0.30   | 0.45        | 0.09-2.34        |
| High                          | Reference |          |                  |

CI – Confidence interval; OR – Odds ratio; FTND – Fagerstrom Test for Nicotine Dependence; INR – Indian rupee

quit, and even after adjusting for confounders, there was a strong positive association. Other studies from India and the United States have also reported positive association between education status and intention to quit.[13,21,22] However, in Thailand, higher education level did not show a strong association with an intention to quit, and in Malaysia, it was not associated with intention to quit.[23] Dhumal et al. reported that income was not associated with intention to quit which in our study shows that a nonsignificant negative association with low income.[22] The odds of quitting among study participants who reported parental tobacco use was 70% (OR; 95% CI: 1.70 [0.65-4.44]) higher as compared to those whose parents did not use tobacco and similar positive attitude was also reported by Twigg et al.[24]

Tobacco use in any form is a type of behavior. On exploring the reasons which led to thinking of changing their behavior, it was observed that money concerns, family pressure, and health concerns were most cited individually or in combination. Concerns about damage to their health because of smoking leading to intention to quit have been reported by other studies from India and China.[19,25-27] Money concerns have been reported by many tobacco users, but Panda et al. reported negative association between price of tobacco and intention to quit.[18] In countries like India, family norms and values are still a part of one’s identity. Hence, family pressure for quitting tobacco plays an important role toward this behavior change. Those participants who quote family pressure or money concern or peer pressure probably want to comply with group/family norms and understand the social implications of becoming a nontobacco user. However, this theory works opposite among groups in which smoking is the norm and experience less social pressure to quit.[28] It is also important to understand that workers in this industry need to do heavy physical work while living in the shabby environment. The low socioeconomic living condition, working pattern, absence of any recreational activity, and peer pressure force them to indulge in various abuse activities.[12]

Limitations
There were several limitations to this study. The data were cross-sectional which limit the ability to determine the directionality of the relations and measure the dynamic processes of quitting and nicotine dependence. The generalizability in this context is limited by the single center of the design. The data were collected from the interview of respondents which may be subjected to recall and response bias. People tend to provide socially desirable responses, and there are differences in levels of perception of the questions asked.

CONCLUSION
Intention to quit was high among the construction site workers. Our data suggest that being literate, late initiators of tobacco use, tobacco in the form of smoking, and high dependency on nicotine are important predictors which need to be explored using longitudinal studies. Sociocultural factors are also important reason to quit which need to be targeted upon while framing interventions to help them to quit.

Implications of practice
Very few studies have explored the problems of construction site workers even though they are more susceptible to substance abuse. There is a need to create an enabling environment (implementing cost-effective behavioral interventions, establishment of tobacco quitlines, programs for awareness) for quitting tobacco among this group. The prevailing legislation pertaining to this group of construction/industrial/migrant workers needs to focus on the health effects of this behavior.

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Conflicts of interest
There are no conflicts of interest.

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