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**Original Research Article**

# Tobacco and alcohol use and dependence among workers in a fish processing factory in coastal Karnataka

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## ABSTRACT

**Background:** Tobacco and alcohol consumption are considered as major public health problems in India. Coastal areas have a considerable number of people engaged in fishing. The strenuous nature of the job, long and irregular working hours may lead to an increased rate of tobacco and alcohol consumption. Therefore, it becomes essential to assess the prevalence of tobacco and alcohol use and factors associated with it among fish factory workers.
**Methods:** A cross-sectional study carried out in a fish processing factory conducted for 12 months. All employees were included. A semi-structured pre-tested interviewer-administered questionnaire was used to collect data about the socio-demographic factors and use of tobacco and Alcohol. The level of dependence was assessed by Fagerstrom addiction and alcohol use disorders identification test. Data analysis was done using SPSS version 15. Results were expressed in terms of proportions. Chi-square test and logistic regression were performed to find an association between socio-demographic factors and tobacco and alcohol use.
**Results:** Among 240 individuals, 90% were males. Mean age was 28.75±9.3 years. 40% were migrants. Almost 60% had a monthly income of ≤6500 Rs. Consumption of tobacco was more common (40.4%) as compared to alcohol (32.1%). When assessed for dependence, 49.0% of tobacco had a moderate level of dependence. 72.7% of alcohol users had a low level of dependence. Unmarried, migrant young males were at higher risk of dependence.
**Conclusions:** Tobacco and alcohol use and their dependence is alarming. There is an urgent need to address this problem by education and also explore other feasible interventions.

**Keywords:** Tobacco, Alcohol, Dependence, Workers, Fish processing factory

## INTRODUCTION

Tobacco and alcohol consumption are considered as significant public health challenges. The consumption of these two substances in India remains relatively high, with approximately 275 million adults consuming tobacco and 70 million consuming alcohol regularly.[1] In India, about 12 million cases of preventable tobacco-related diseases occur every year.[1] Despite its harmful consequences, there is inadequate recognition of alcohol misuse as a public health issue in India.[2]

Udupi is a coastal district in Southern part of India. A considerable number of people are engaged in fishing and a related activity which is an essential source of income in the coastal areas.[3] However, the people associated with this occupation suffer from various health-related issues. Due to the strenuous nature of their job, long and

irregular working hours, the stress levels are generally perceived to be relatively high, which may lead to an increased rate of tobacco and alcohol consumption. Low socioeconomic status, lack of literacy, separation from family may also play a role.[3]

The literature regarding alcohol and tobacco use among workers in the fish processing industry is sparse. Hence this study was undertaken to assess the prevalence of tobacco and alcohol use and factors associated with its dependence among workers in this industry.

### *Objectives*

Objectives of current study were; to assess the prevalence of tobacco and alcohol use among workers in the fish processing industry and to assess the level of tobacco and alcohol dependence and factors associated with these among the users.

## METHODS

### *Participants*

A cross-sectional observational study was conducted in a fish processing industry situated in coastal Karnataka for a period of 12 months (from January to December 2017). All the employees of the industry were included in the study. Written informed consent was obtained from all the participants.

The information pertaining to socio-demographic factors and the use of tobacco and alcohol were collected. A semi-structured pre-tested interviewer-administered questionnaire was used to collect data. A current tobacco user was defined as those who have used tobacco products during the last year. Current alcohol users were defined as a person who consumed any beer/spirits during the last one year. If any worker was a current consumer of tobacco or alcohol, they were assessed further for the level of dependence using Fagerstrom addiction scale or alcohol use disorders identification test (AUDIT), respectively.[4,5] To maintain confidentiality, personal details regarding the alcohol and tobacco use were collected in a separate questionnaire.

### *Procedure*

The study proposal was discussed with the factory management, and their permission and cooperation were sought. After the permission was obtained, a detailed plan for data collection was made. It was decided to visit the factory once a week on mutually convenient dates. A total of 245 workers were working in any of the three shifts, which rotated every week. Those working during the forenoon hours were assessed on a particular day, and in subsequent weeks the other groups were assessed. They were called in batches of 10-15 so that the working of the factory was not affected. The purpose of the visit was explained to them in the language they understood. Written informed consent of the individuals was obtained before initiating the data collection. The trained health care team comprising of doctors, medico-social workers, one psychiatrist and a lab technician, carried out the physical and mental health status examination of the workers in the industry premises. Health education and counselling sessions were also held simultaneously by the accompanying medico-social workers and the psychiatrist. Finally, a visit was made to include all those who were on leave or could not be examined earlier.

### *Statistical analysis*

Data analysis was done using statistical package for social sciences (SPSS) version 15 for Windows. The prevalence of health problems was expressed in proportions. Chi-square test was performed to assess the difference in prevalence between the categories of selected independent variables. Results were expressed in percentages with $p<0.05$ being considered significant.

## RESULTS

A total of 245 fish factory workers participated in the study. However, five of the proforma were found to be incomplete; thus, only 240 individuals were included for analysis. Majority of the study participants were males. The mean age of the participants was 28.75±9.3 years. As seen in (Table 1). the age and income categorisation of the study participants was done based on their interquartile range. Almost fifty per cent (48.8%) of the participants belonged to the age group of 22-34 years whereas, 58.8% had a monthly income of less than or equal to Rs. 6500. Among the workforce, 40% were migrants, mostly belonging to North-Eastern states of India. Apart from monthly income, the individuals were also provided with amenities like free accommodation, medical benefits and subsidised food.

Tobacco consumption was reported to be more common 97 (40.4%) as compared to that of alcohol 77 (32.1%). Out of the 240 participants, 68 (28.3%) consumed both Tobacco as well as Alcohol. Among tobacco users, 69 (71.4%) used smokeless tobacco, 7 (7.1%) had a habit of smoking, and 21 (21.5%) consumed both. The most commonly consumed smokeless products included tobacco leaves, khaini and gutka while the cigarette was the most commonly used smoking product. Similarly, whisky (54.5%), followed by beer (29.9%) were the most commonly used alcohol products among the participants (Table 2).

When assessed using Fagerstrom test for nicotine dependence, the majority (49.0%) of tobacco users showed the moderate level of dependence, whereas, among alcohol users, a majority (72.7%) showed a low level of dependence when assessed using AUDIT scale (Table 3).

None of the females in the factory reported consumption of tobacco and alcohol consumption; hence the prevalence was calculated among males. As observed, the prevalence of tobacco and alcohol consumption was found to be high among the workers who belonged to the age group of 23-34 years; who were unmarried and migrants' participants having an income of Rs. 6500 or less. However, tobacco and alcohol consumption were found to be significantly high among migrant workers (Table 4-5).

**Table 1: Socio-demographic characteristic (n=240).**

| Variable | Frequency (%) |
|---|---|
| **Gender** | |
| Male | 214 (89.2) |
| Female | 26 (10.8) |
| **Age group (years)** | |
| ≤ 22 | 66 (27.5) |
| 23-34 | 117 (48.8) |
| > 34 | 57 (23.8) |
| **Marital status** | |
| Unmarried | 168 (70.0) |
| Married | 72 (30.0) |
| **Income (rupees)** | |
| ≤6500 | 141 (58.8) |
| 6501-8000 | 60 (25.0) |
| >Rs 8000 | 39 (16.3) |
| **Occupation** | |
| Unskilled workers | 178 (74.2) |
| Skilled workers | 43 (17.9) |
| Clerks | 5 (2.1) |
| Supervisors | 7 (2.9) |
| Administrators | 7 (2.9) |
| **Domicile** | |
| Local | 144 (60) |
| Migrant | 96 (40) |

**Table 2: Prevalence of tobacco and alcohol use (n=240).**

| Variable | Frequency (%) |
|---|---|
| **Tobacco** | 98 (40.8) |
| Smokeless | 70 (71.4) |
| Smoking | 7 (7.1) |
| Both | 21 (21.5) |
| **Alcohol** | 77 (32.1) |
| Whisky | 42 (54.5) |
| Beer | 23 (29.9) |
| Others | 12 (15.6) |
| Both | 68 (28.3) |

## DISCUSSION

There is a paucity of literature regarding tobacco and alcohol use specifically among fish processing industry workers. In our study, the majority of the participants were young males in their productive age group of 18-30 years. Nearly three-fourths of the study population were unskilled labourers, and 70% of them were unmarried. 40% of them were migrant workers. More than 40% of the workers consumed tobacco products, while 32% consumed alcohol. 28.3% consumed both Tobacco as well as alcohol.

**Table 3: Level of tobacco and alcohol dependence among the participants.**

| Variable | Frequency (%) |
|---|---|
| **Tobacco (n=98)** | |
| Low (1-2) | 7 (7.1) |
| Low to moderate (3-4) | 18 (18.4) |
| Moderate (5-7) | 48 (48.9) |
| High (≥8) | 25 (25.6) |
| **Alcohol (n=77)** | |
| Low (≤7) | 56 (72.7) |
| Medium (8-15) | 18 (23.4) |
| High (≥16) | 3 (3.9) |

In a study conducted in the adjoining district of Mangalore, the prevalence of tobacco usage among workers in a plywood factory was found to be around 53.7%. Prevalence of smoking, tobacco chewing and mixed (smoking/ tobacco chewing) was found to be 11.9%, 41.8% and 5.22%, respectively.[6] In another study conducted among tea industry workers in Assam by Medhi et al 58% used at least one substance, either tobacco or alcohol and 27.4% used multiple substances. The prevalence of smokeless tobacco use was 52.5%, and that of smoking was 2.2%. The prevalence of alcohol consumption was 32.2%.[7]

Dutta et al conducted a study in a chemical fertiliser company and reported that the prevalence of harmful use or dependence on tobacco was found to be 28.57% while the prevalence of harmful use or dependence on Alcohol was 6.7%.[8] Ahmed et al conducted a study in Mangalore, South India, and reported that the overall prevalence of alcohol use among industrial workers was 55.2%, which was higher as compared to our finding of 32%.[9]

Prasad et al. conducted a study to assess the health status of the brick industry workers in Wardha district, Maharashtra. They reported that 89% of the workers chewed tobacco and tobacco products, 4% smoked, and about 58% of workers consumed alcohol. The reasons attributed to the use of tobacco and alcohol were peer pressure, family problems, for relaxation, and to work faster.[10] Acharya et al reported from their study that 62.7% of fish processing industry workers regularly consumed chewing tobacco and the common reasons for the habit was the co-workers' influence and to keep awake at work.[3] However, alcohol use was not reported in this study.

The prevalence of tobacco use among industrial workers thus was much higher as compared to the report of global adult tobacco survey (GATS-2, 2016-17), which found that 28.6% of adults aged 15 and above use tobacco in the country.[11] In southern India, the prevalence of alcohol use varies between 33% and 50%, possibly depending on education and socioeconomic levels of the individuals.[12]

**Table 4: Association between tobacco use and socio-demographic variables.**

| Tobacco use | | | | | | |
|---|---|---|---|---|---|---|
| **Variable** | **Non-users (n=142) frequency (%)** | **Users (n=98) frequency (%)** | **Unadjusted P value** | **Unadjusted OR 95% CI** | **Adjusted P value** | **Adjusted OR 95% CI** |
| **Age (years)** | | | | | | |
| ≤22<br>23-34<br>>34 | 34 (23.9)<br>76 (53.5)<br>32 (22.5) | 32 (32.7)<br>41 (41.8)<br>25 (25.5) | 0.181 | 1.2 (0.6-2.5)<br>0.7 (0.4-1.3)<br>1 | - | - |
| **Marital status** | | | | | | |
| Unmarried<br>Married | 97 (68.3)<br>45 (31.7) | 71 (72.4)<br>27 (27.6) | 0.492 | 1.2 (0.7-2.2)<br>1 | - | - |
| **Income (Rs)** | | | | | | |
| ≤6500<br>6501-8000<br>>8000 | 78 (54.9)<br>36 (25.4)<br>28 (19.7) | 63 (64.3)<br>24 (24.5)<br>11 (11.2) | 0.184 | 2.1 (0.9-4.5)<br>1.7 (0.7-4.0)<br>1 | - | - |
| **Domicile** | | | | | | |
| Migrant<br>Local | 42 (29.6)<br>100 (70.9) | 54 (55.1)<br>44 (44.9) | <0.005 | 2.9 (1.7-4.9)<br>1 | <0.005 | 2.9 (1.7-4.9)<br>1 |

**Table 5: Association between alcohol use and socio-demographic variables.**

| Alcohol use | | | | | | |
|---|---|---|---|---|---|---|
| **Variable** | **Non-users (n=142) frequency (%)** | **Users (n=98) frequency (%)** | **Unadjusted P value** | **Unadjusted OR 95% CI** | **Adjusted P value** | **Adjusted OR 95% CI** |
| **Age (years)** | | | | | | |
| ≤22<br>23-34<br>>34 | 43 (26.4)<br>84 (51.5)<br>36 (22.1) | 23 (29.9)<br>33 (42.9)<br>21 (27.3) | 0.444 | 0.9 (0.4-1.9)<br>0.7 (0.-1.3)<br>1 | - | - |
| **Marital status** | | | | | | |
| Unmarried<br>Married | 114 (69.9)<br>49 (30.1) | 54 (70.1)<br>23 (29.9) | 0.976 | 1.0 (0.6-1.8)<br>1 | - | - |
| **Income (Rs)** | | | | | | |
| ≤6500<br>6501-8000<br>>8000 | 94 (57.7)<br>40 (24.5)<br>29 (17.8) | 47 (61.0)<br>20 (26.0)<br>10 (13.0) | 0.644 | 1.5 (0.7-3.2)<br>1.5 (0.6-3.5)<br>1 | - | - |
| **Domicile** | | | | | | |
| Migrant<br>Local | 46 (28.2)<br>117 (71.8) | 50 (64.9)<br>27 (35.1) | <0.005 | 4.7 (2.6-8.4)<br>1 | <0.005 | 4.7 (2.6-8.4)<br>1 |

The higher prevalence of tobacco and alcohol use among our study population may be attributed to the fact that most of the respondents to our study were young, unskilled labourers belonging lower socioeconomic status who are migrants and are staying away from their families. Marital status and domicile (whether local or migrant population) were found to be statistically significant with tobacco consumption. A similar observation was made in various studies done across the country wherein a high prevalence of tobacco and alcohol consumption was reported among the migrant workers.[13-15] Current study also found that among tobacco users, 69 (71.4%) used smokeless tobacco, 7 (7.1%) had a habit of smoking, and 21 (21.5%) consumed both. The most consumed smokeless products included tobacco leaves, khaini and gutka while the cigarette was the most commonly used smoking product. As per the findings of GATS-2, khaini is the most commonly used tobacco product in the country, followed by beedi and gutka.[11]

In current study, the prevalence of smokeless tobacco use is very high compared to smoking which was higher as compared to the studies done in other parts of the country.[16-18] This could be due to the fact that smokeless tobacco use is part of the cultural practices and there is much less stigma attached to its use as compared to

smoking. Along with this low cost of smokeless tobacco products, and a general impression that it is less harmful, and it prevents a toothache can be a significant cause of high smokeless tobacco usage. Current study showed that 48.9% of individuals who consumed tobacco (both smoking and smokeless) had a moderate level of dependence, while 25.6% had a high level of nicotine dependence. While Akram et al who had conducted a study in a plywood factory, reported that among smokers 9.7% of industrial workers had a high level of nicotine dependence and 2.23% of industrial workers had a moderate level of nicotine dependence.[8]

The present study also found that more than 27% of the workers were addicted to Alcohol had a moderate or high level of dependence. Among the types of alcoholic beverages consumed, whisky (54.5%) followed by beer (29.9%) were the most commonly used ones among our study participants. The results were similar to the studies done by Ahmed et al and Rathod et al wherein 36.5% and 33.2% were reported hazardous drinking as per AUDIT scoring system.[9,19]

## CONCLUSION

The level of tobacco and alcohol consumption among industrial workers is found to be higher than in the general population and could be due to the strenuous nature of work. The majority of the employees were unmarried, young males working as unskilled labourers. These individuals are more likely to initiate tobacco use as they are away from family. Unmarried marital status and migrant domicile were found to be significantly associated with tobacco consumption. The study henceforth recommends that there is an urgent need to incorporate health education regarding the ill-effects of the same systematically. There is an urgent need for providing counselling and treatment for workers in occupational settings. There must be a strict prohibition of Tobacco and Alcohol from the factory premises and immediate vicinity. The workers must be provided with healthy forms of entertainment to keep them away from substance use.

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## REFERENCES

1. Rane PP, Narayanan P, Binu VS, Unnikrishnan B. Prevalence of Tobacco and Alcohol Consumption among Fishermen in Udupi Taluk, Karnataka, India: a Cross-Sectional Study. Asian Pac J Cancer Prev. 2016;17(4):1733-7.
2. Dutta R, Gnanasekaran S, Suchithra S, Srilalitha V, Sujitha R, Sivaranjani S, et al. A population-based study on alcoholism among adult males in a rural area, Tamil Nadu, India. J Clin Diagn Res. 2014;8 (6):JC01-3.
3. Acharya S, Pentapati KC, Acharya S. Socioeconomic mobility and tobacco consumption patterns in fish industry workers in Udupi District of coastal Karnataka. Indian J Dent Res. 2014;25:653-6.
4. Heatherton TF, Kozlowski LT, Frecker RC, Fagerström KO. The Fagerström Test for Nicotine Dependence: a revision of the Fagerström Tolerance Questionnaire. Br J Addict. 1991;86(9):1119-27
5. Saunders JB, Aasland OG, Babor TF, De la Fuente JR, Grant M. Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. Addiction. 1993;88(6):791-804.
6. Akram S, Gururaj NA, Nirgude AS, Shetty S. A study on tobacco use and nicotine dependence among plywood industry workers in Mangalore City. J Evol Med Dent Sci. 2015;4(33):5729-35.
7. Medhi GK, Hazarika NC, Mahanta J. Tobacco and alcohol use among the youth of the agricultural tea industry in Assam, India. Southeast Asian J Trop Med Public Health. 2006;37(3):581-6.
8. Dutta S, Kar N, Thirthalli J, Nair S. Prevalence and risk factors of psychiatric disorders in an industrial population in India. Indian J Psychiatry. 2007;49(2):103-8.
9. Ahmed MV, Gururaj NA, Nirgude AS, Akram MS. Prevalence and patterns of alcohol intake among industrial workers in mangalore: an appraisal by the alcohol use disorders identification test. J Evol Med Dent Sci. 2015;4(66):11446-52.
10. Prasad MA, Nayak S, Mudey AB, Dhande N, Chandrakar D. Assessment of health status of the brick industry workers in Wardha District. J Acad Ind Res. 2016;5(1):1-4.
11. Global adult tobacco survey-2. Available at: http://www.searo.who.int/india/mediacentre/events/2017/gats2_india.pdf?ua=1. Accessed on 2 March 2018.
12. Rajeev A, Abraham SB, Reddy TG, Skariah CM, Indiradevi ER, Abraham J. A community study of alcohol consumption in a rural area of South India. Int J Community Med Public Health. 2017;4:2172-7.
13. Gupta RK, Kumari R, Langer B, Singh P, Akhtar N, Gupta R. Prevalence, patterns and determinants of smoking among migrant workers in Jammu region

of Jammu and Kashmir, India. Int J Res Med Sci. 2018;6:2682-5.
14. Adsul BB, Laad PS, Howal PV, Chaturvedi RM. Health problems among migrant construction workers: A unique public private partnership project. Ind J Occup Environ Med. 2011;15(1):29-32.
15. Amrutha AM, Karinagannanavar A, Ahmed M. Proportion of smokers and its determinants among migrant workers in Mysore, Karnataka, India. Int J Community Med Public Health. 2016;3:856-60.
16. Rajeshkannan S, Parthiban P. Prevalence and perceptions about tobacco use among migrant construction workers: A community-based cross-sectional survey. Int J Med Sci Public Health. 2018;7(11):928-33.
17. Laad PS, Adsul BB, Chaturvedi RM, Shaikh M. Prevalence of substance abuse among construction workers. Paripex Indian J Res. 2013;2:280-3.
18. Parashar M, Dwivedi S, Singh M, Patavegar B, Bhardwaj M. Tobacco use behavior among construction site workers of Delhi, India. Int J Health Allied Sci. 2017;6:210-4.
19. Rathod SD, Nadkarni A, Bhana A, Shidhaye R. Epidemiological features of alcohol use in rural India: a population-based cross-sectional study. BMJ. 2015;5(12):225-9.

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