

Original Research Article

Prevalence of behavioral risk factors of non-communicable diseases in Mumbai: a descriptive cross-sectional study

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Received: 30 March 2024

Revised: 17 May 2024

Accepted: 18 May 2024

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ABSTRACT

Background: Globalization and urbanization have led to lifestyle changes among urban poor, which need to be understood, as the urban areas are undergoing rapid transitions. The behavioral risk factors are mainly responsible for the causation of non-communicable diseases (NCD). Objectives were to know prevalence and pattern of behavioral risk factors for NCDs in Naigaon, BDD Chawl, Mumbai to initiate steps for preventive interventions.

Methods: This was community based cross-sectional study conducted among residents of Naigaon, BDD Chawl, Mumbai, India. Data were collected by the house-to-house survey using predesigned and pretested Performa. The world health organization-stepwise approach was used for chronic disease risk factor surveillance. Descriptive statistics and chi-square test were used for analysis.

Results: About 65% of the respondents use smokeless form of tobacco, while 19% are using smoke form of tobacco. Among tobacco users nearly half have been using tobacco for the past 16 years. Nearly half (48%) of respondents were current alcohol drinkers. All the respondents in the study population consume less than five servings of fruits and vegetables which is less than WHO recommended servings. About 67% of the respondents were involved in the moderate type of activities.

Conclusions: Study found high prevalence of NCD risk factors in the population. These risk factors have been prevalent since more than decade so, there may be very high burden of NCD soon in the study area. Screening and IEC activities need to be strengthened for diagnosis and preventive measures can be implemented at early stage of life.

Keywords: Risk factors, Urbanization, NCD, Health behavior, Health protective behavior

INTRODUCTION

Non-communicable diseases (NCD) are rapidly increasing in many developing countries, largely due to demographic and lifestyle changes. Nearly 80% of NCD deaths occur in low-and middle-income countries and NCD are the most frequent causes of death in most countries.¹ India is no exception to this, where NCD are fast replacing communicable diseases. NCDs contribute to 55.4% disability adjusted life years (DALYs) in India and of the total deaths, 61.8% deaths were in 2015.²

The scenario of the burden of NCD is very high throughout the world. Initially the condition was different that only high-income country is more prone to the NCD but the condition has changed now even middle income and low-income countries also facing the burden of the diseases, due to change in the lifestyles and lifestyle related habits. Heart disease, stroke, cancer and other chronic NCD contributed to 35 of the 58 million deaths (60.3%) in the world in 2005.³ Now it is very difficult to the policy makers and programmer because of the double burden of the Diseases the existence of the communicable

diseases and emerging of the new form of the NCD and became difficult to them to utilize the existences resources with this double burden of diseases. Most of the resources are involved in the prevention and control of communicable diseases which are still not eradicated.

Unhealthy diet and physical inactivity are the leading causes of the major non communicable diseases. The important risk factors identified are high blood pressure, high serum cholesterol, inadequate intake of fruits and vegetables, obesity, physical inactivity and tobacco use. Smoking also increases the risk for these diseases, although largely through independent mechanisms.⁴ The causes of the NCD are totally depends on the prevalence of risk factors, hence the prevention of these risk factors is the main concern with treatment of that diseases. Most NCD last for the lifelong and disability is most frequently seen in these diseases.

These factors are interrelated to each other so much so that appearance/occurrence of one factor paves the way for the other, thereby leading to the development of NCD. Risk operates in continuum with adverse events in persons with modest elevation of many risk factors, having a multiplicative effect. Therefore, primary prevention of occurrence of risk factors along with their early identification and management can help delay the progress to NCDs.⁵

The risk factors which are responsible for causing NCD are avoidable if individual have proper knowledge regarding the harmfulness of the particular substance or the habit. Effective prevention strategies for NCD do exist. However, they require specific data on risk factors so that priorities can appropriately be set and targeted interventions developed and monitored. The WHO Global NCD risk factor surveillance initiative directly responds to this need.⁶

In India there are limited studies which have focused on assessing the prevalence of behavioral risk factors exclusively in urban slum population. This study described the pattern of distribution of behavioral risk factors among the urban slum population of BDD chawl, Naigaon of Mumbai, where no such study has been conducted before.

METHODS

This was a community based, cross-sectional study, and data collection was done by principle investigator in July 2014. This study was carried out among the residents of BDD Chawl, Naigaon, Mumbai aged 20 years and above. Due to unavailability of data on risk factors for NCDs, the sample size of convenience was taken. Using a structured interview schedule (WHO-STEP wise standardized questionnaire) 160 respondents of age group 20 years and above age group were interviewed by the principal investigator of this study. Fruit and vegetables intakes

were determined showing, spoons, cups, and show-cards as given in Figure 1 and 2.

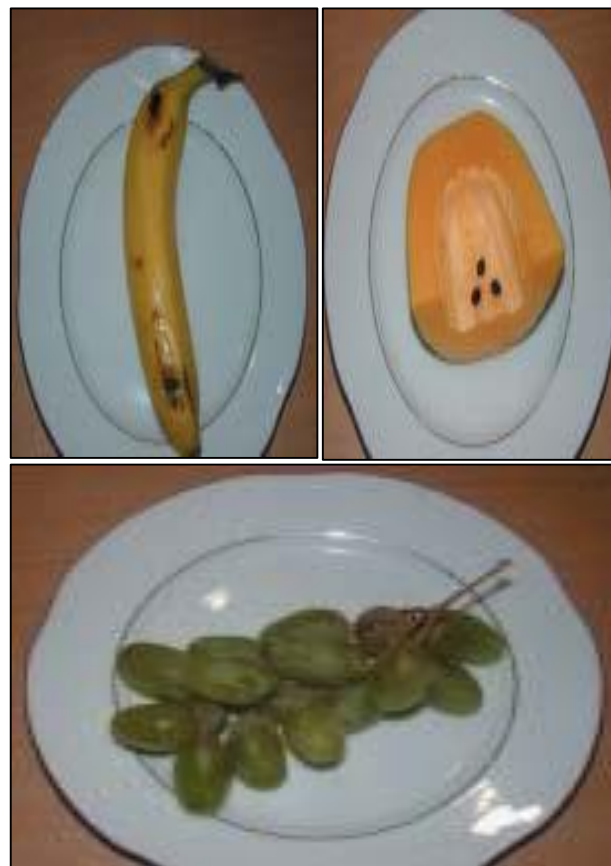


Figure 1: Show-card for fruits.



Figure 2: Show-card for vegetables.

Sampling procedure

This study has used multi-stage sampling technique for selection of the samples. There were about 42 chawls in the BDD, Naigaon from that each chawl has 80 households. Total $80 \times 42 = 3360$ households were present in the study area. Four clusters were formed by dividing the BDD chawl area in four groups of ten buildings each. One building from each cluster was chosen by using simple random sampling. From each chosen building 40 households (50% of the total 1 cluster) were interviewed by using systemic random sampling by visiting alternate household in the building ($4 \times 40 = 160$). For the household which refused for interview or locked or does not have eligible sample the next household to it was included in the study.

The WHO has recommended surveillance of common risk factors with the "STEP wise" approach, which uses standardized instruments and protocols for collecting, analyzing and monitoring trends for risk factors within and across countries.^{6,7} The STEP wise approach is to collect the data on the risk factors of NCD like primary risk factors and the biochemical measurements like blood glucose level, BP checkup, cholesterol level etc., and the measuring the anthropometric measurement. WHOSTEP wise approach has a standardized questionnaire which is applicable to every corner of the world. Risk factors at step 1 were assessed in this study.

WHO had divided the risk factors of NCD into 2 parts primary risk factors include Tobacco consumption (smoke and smokeless form), alcohol consumption, unhealthy dietary pattern, physical inactivity. Blood sugar, increased BP, increased Cholesterol etc. are secondary risk factors, and the primary risk factors are modifiable and to prevent the NCD it is necessary to focus on the primary risk factors which are most modifiable.

Successful intervention in the early age group will result in healthy life year's gain in the reproductive period of life. Therefore, there is need to understand the distribution of behavioral risk factors.

The data were entered and analyzed using statistical package for social scientists (SPSS) version 20 and the analysis is done. Informed consent was taken from the respondents.

Operational definitions

Prevalence used by epidemiologists, healthcare providers, government agencies and insurers. In epidemiology, the prevalence of a health-related state (typically disease, but also other things like smoking) in a statistical population is defined as the total number of cases of the risk factor in the population at a given time, or the total number of cases in the population, divided by the number of individuals in the population. It is used as an estimate of

how common a disease is within a population over a certain period. It helps physicians or other health professionals understand the probability of certain diagnoses and are routinely used by the epidemiologist.

Risk factors

A risk factor is a variable associated with an increased risk of disease or infection. Sometimes, determinant is also used, being a variable associated with either increased or decreased risk.

NCD

A non-communicable disease, or NCD, is a medical condition or disease which is non-infectious. NCDs are diseases of long duration and generally slow progression. They include heart disease, stroke, cancer, asthma, diabetes, chronic kidney disease, osteoporosis, Alzheimer's disease, cataracts, and more. While often referred to as "chronic diseases", NCDs are distinguished by their non-infectious cause. In contrast, some chronic diseases such as HIV/AIDS, while also lasting medical conditions, are caused by transmissible infections. They are similar in that they also require chronic care management.

Current daily smokers: currently smoking cigarettes, beedi or hookah daily.

Current daily smokeless tobacco users: currently using chewable tobacco products such as gutkha, naswar, khaini or zardapaan daily, betel also MISRI (for brushing teeth).

Current alcohol consumption: consumed alcohol at least once in last 30 days.

One standard drink: equivalent to consuming 1 standard bottle of regular beer (285 ml), one single measure of spirits (30 ml) or one medium size glass of wine (120 ml).

Physical inactivity: Less than 10 minutes of activity at a stretch during leisure, work, or transport.

Chawl: A usual tenement in a chawl consists of one all purpose room that functions both as a living and sleeping space, and a kitchen that also serves as a dining room.

Servings

For raw green leafy vegetables-1 serving=one cup, for cooked or chopped vegetables, 1 serving=half cup, for fruit (apple, banana, orange), 1 serving=1 medium size piece, for chopped, cooked and canned fruit, 1 serving=half cup; and for juice from fruit, 1 serving=half cup.

RESULTS

Table 1 depicts, majority (85%) of sample from the study lies in the working age group of 30-60 years. More than

half of the study sample was educated till secondary schooling while one fourth of the sample was illiterate or completed primary education. More than half (59%) of the sample belongs to Buddhist community followed by Hindu community (38%) and remaining population belongs to other communities. Half of the sample population has monthly income in bracket of Rs. 6000-10000, while less than one third sample has monthly income below Rs. 6000. One third of the sample was working with the non-government sector; few (14%) were working in the government sector.

Table 1: Socio-demographic (BDD Chawl, Naigaon, Mumbai, 2013), (n=160).

Variables	Frequency, N (%)
Age (in years)	
20-30	11 (6.9)
31-40	52 (32.5)
41-50	50 (31.3)
51-60	36 (22.5)
>60	11 (6.9)
Sex	
Male	97 (60.6)
Female	63 (39.4)
Education	
Illiterate	21 (13.1)
Primary	25 (15.6)
Secondary	90 (56.3)
Higher secondary	18 (11.3)
Graduates	06 (3.8)
Religion	
Hindu	61 (38.1)
Buddhism	94 (58.8)
Others	5 (3.1)
Category	
Schedule caste	108 (67.5)
Other backward caste	13 (8.1)
General and others	39 (24.4)
Monthly income (INR)	
1000-6000/month	47 (29.4)
6001-10000/month	85 (53.1)
100001-20,000/month	19 (11.9)
Above 20,0001	09 (5.6)
Occupation	
Government employee	23 (14.4)
Non-government employee	49 (30.6)
Self-employed	06 (3.8)
Housewife	47 (29.4)
Retired	07 (4.4)
Unemployed (but able to work)	22 (13.8)
Others	06 (3.8)

Tobacco consumption

As shown in Table 2, 65.5% of the respondents have the habit of using smokeless form of the tobacco, 19.4% have the habit of smoke form of tobacco and 9.4% were using tobacco in both forms. It shows that none of the female

reported about using smoke form of tobacco, but they were using smokeless form of tobacco, 95% of females were found using the smokeless form of tobacco. About 52.5% of the population from the 160 respondents has the habit of drinking alcohol; there are no female respondents are drinkers due social and cultural.

Table 2: Consumption of tobacco and alcohol.

Risk factor status	Male, (n=97) (%)	Female, (n=63) (%)	Total, (n=160) (%)
Smoke form	31 (31.9)	00 (0.0)	31 (19.4)
Smokeless form	45 (46.3)	60 (95.2)	105 (65.5)
Both	15 (15.4)	00 (0.0)	15 (9.4)
None	06 (6.1)	03 (4.8)	09 (5.6)
Consumed alcohol in last 30 days	77 (79.3)	0 (0.0)	77 (48.1)

The frequency of chewing tobacco is about 44.6% in the study population, the use of gutka, paan masala and betel is comparatively less.

In female use of the MISRI was found more prevalent. 60 out of 63 interviewed females have the habit of using “MISRI” for brushing their teeth. The mean age of starting this kind of habit is from the age of 13 years.

About 48% of the individuals were using the smokeless form of tobacco for more than 16 years (Table 3).

Table 3: Duration of use of smokeless form of tobacco.

Duration of use of smokeless form of tobacco (in years)	N (%)
2-5	09 (5.6)
6-10	13 (8.1)
11-15	20 (12.5)
>16	78 (48.8)
Not applicable	40 (25.0)
Total	160 (100)

Alcohol consumption

As shown in Table 4, nearly half (48%) of the respondents were found to be current alcohol drinkers. It is observed that in the age group 31-40 years has higher respondents with the consumption of alcohol in past 30 days. It also indicates that there is a strong significant association between age as well as the consumption of alcohol.

About 19.5% of the respondents found to consume alcohol 2-3 days a week and about 28.6% reported that they drink alcohol occasionally. However, 42 percentages of the respondents consume alcohol once in the week (Table 5).

Table 4: Age wise alcohol consumptions.

Age groups (in years)	Consumption of alcohol in last 30 days		Chi-square	P value
	Yes, N (%)	No, N (%)		
20-30	04 (36.3)	07 (63.6)	14.9359	0.0048**
31-40	35 (67.3)	17 (32.6)		
41-50	15 (30.0)	35 (70.0)		
51-60	18 (50.0)	18 (50.0)		
61+	05 (45.4)	06 (54.6)		
Total	77 (48.1)	83 (51.8)		

**Significant at the level of $p < 0.01$.

Table 5: Frequency of alcohol consumption, (n=77).

Frequency of alcohol consumption (day/week)	N	Percentage (%)
1	32	41.6
2-3	15	19.5
4-5	05	6.5
Daily	03	3.9
Occasionally	22	28.6
Total	77	100

Fruits and vegetables intake

It was found that none of the respondents eats fruit regularly or 3-4 times a week while 60% of the respondents consume fruits 1-2 days a week and 30% responded that they eat fruits occasionally. Mean per capita consumption of fruit servings per day was asked (servings-show card) 1.2 per day servings, average fruit consumption was very low. More than half of the respondents take the vegetables 3-4 days a week and 39% of them take them almost daily but the servings per day vary a lot. Average daily consumption of vegetables in the surveyed population was 2.2 servings. So, the total mean consumption of fruits and vegetables per day was 3.4 servings. It indicates that it is well below the WHO standard of eating five servings of fruits and vegetables per day.

Table 6: Frequency of fruits and vegetables intake, (n=160).

Variables	Respondents, N (%)
Fruit intake	
Regularly/3-4 times a week	0 (0.0)
1-2 days/week (sometimes)	97 (60.6)
Occasionally	48 (30.0)
Never	15 (9.3)
Vegetable intake	
Regularly/3-4 times a week	88 (55.0)
Sometimes	72 (45.0)
Never	0 (0.0)
Physical activity	
Vigorous	11 (6.8)
Moderate	108 (67.5)
Least	41 (25.6)

Physical activity

About 67.5% of the respondents only involved in the moderate type of activity, it most of the include the activity like walking to catch the bus/train, household chores, washing clothes etc. only 6.9% involved in the activity related to the vigorous type of activity.

Almost 85% of the respondents involved themselves in activities like watching TV, 67.5% in household chores and only 19.4 percent do exercise like jogging/walking.

DISCUSSION

Behavioral risk factors are the modifiable forms of behavior which can be modified through health education and health promotion. Prevalence of smoking in the current study is 19.4% which is in line with other studies conducted in urban industrial area of India.⁸ It was found that female did not use smoke form of tobacco but found using smokeless form of tobacco more than the males which is in line with a larger study conducted in urban population of Mumbai.⁹ Finding of study done in rural population of Bangladesh for behavioral risk factors of NCD's also reported similar results.⁷ Majority (95%) of the female respondents and less than half (46%) of male respondents were using smokeless form of tobacco, which is greater than the prevalence of smokeless form of tobacco (30% in males and 13% in females) observed in global adult tobacco survey in 2016-17.¹⁰ While behavioral risk factor survey in rural population is closer to the prevalence of smokeless form of tobacco (male 14%, female 27%).⁷ The data available for India through national family health survey (NFHS) and GATS provide an overview of the determinants of tobacco use.^{11,10}

One of the notable finding of the current study is that all the study population (100%) consumes <5 servings of fruits and vegetables per day, which is in line with findings of study conducted in Punjab by Thakur et al in 2014-15 which suggests vast majority (96%) of study population consumes <5 servings per day.¹² Behavioral risk factors study in slums of Kathmandu which shows little higher consumption of fruits and vegetables per day but numbers of servings are low which is in line with the current study.¹³ In a study from 52 low and middle-income countries 77.6% of men and 78.4% of

women consumed less than the minimum recommended servings of F and V. Same study reported 74% low F and V consumption amongst adults in India.¹⁴ Findings of the current study on low physical activities is consistent with the fact that leisure-time or recreational physical activity levels are extremely low in India. More than 90% of individuals in both urban and rural areas reported doing no recreational physical activity as per the larger study conducted by Anjana et al.¹⁵ The WHO recommends that individuals perform at least 150 minutes of moderate to vigorous physical activity per week for the maintenance of health. In India at the present time, more than half of the population do not meet these recommendations. Moreover, individuals appear to derive most of their physical activity from the occupational domain.¹⁵

Current study found that the consumption of alcohol is less frequent than a study conducted in the middle-aged men in western India found about a third of all drinkers (32.8%) reported drinking almost every day (six or more days per week), and over half (50.6%), four or more days per week.¹⁶

CONCLUSION

Most of the participants in the study have habit of using smokeless form of tobacco, "MISRI" was most frequently used habit and mostly among women. The habit of eating Mawa (Tobacco chewing) is mostly observed in the respondents. Smoking and alcohol consumption was also observed in this community eating habit, most of them follow mixed type of food and frequency of eating meat was more than the vegetables. A very less population has the habit of doing exercise/yoga.

Recommendations

IEC activities in areas like Naigaon to make them more aware about harmful effects of using tobacco chewing, smoking and most important habit i.e. brushing "MISRI". Motivating the community by giving health talks about the importance of physical activity and motivating them to involve themselves in leisure with activity like exercise or jogging. Promoting a healthy diet requires a multi-sectoral approach. There is a need for close cooperation among the health, agriculture and food industry sectors.

ACKNOWLEDGEMENTS

Authors would like to thank to school of health systems studies, Tata institute of social sciences, Mumbai for providing the opportunity and guidance for conducting this study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Paslawar SK, Kalaskar SK. Prevalence of behavioral risk factors of non-communicable diseases in Mumbai: a descriptive cross-sectional study. *Int J Community Med Public Health* 2024;11:2317-23.