An introspection into Behavioral Risk Factors and Clinical Risk Factors Leading to Non-Communicable Disease: A Cross Sectional Study

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Abstract

Background: The burden of non-communicable disease is escalating at an alarming rate. It is mainly because of urbanization and economic improvement, which led to a sedentary lifestyle like increased food consumption, tobacco-use, and decreased physical activity. The 4 main types of non-communicable diseases are cardiovascular diseases, cancers, chronic respiratory diseases and diabetes. The risk factors for non-communicable disease are grouped into 3 categories: Behavioral, metabolic and biochemical risk factors. Behavioral risk factors include tobacco use, alcohol use, unhealthy diet and lack of physical activity. Metabolic risk factors include overweight, obesity, diabetes and hypertension. Biochemical risk factors include hypercholesterolemia and hypertriglyceridemia.

Aim: The aim of the present study was to estimate the prevalence and risk factors of non-communicable diseases.

Materials: A cross-sectional study was conducted among the selected community during November 2020 to June 2021 among 1,500 study participants. Participants were selected randomly. A predesigned, pretested, semi structured modified WHO STEPs questionnaire was used. Chi square and Multiple Logistic Regression was done to understand association.

Results: Among the 1,500 participants the sample had 66.7% females and 33.3% males. Majority of the study participants studied up to secondary school (44.7%) and 52% were not involved in any occupation at the time of study. (26%) were tobacco smokers and (68%) were tobacco chewing. (36%) were alcoholic. (89.3%) had exercised for <2.5 h. 68% were taking vegetables >10 times/week and 88.7% were taking fruits <5 times/week. (26%) were overweight, (45.3%) had abdominal obesity and 31% were hypertensive. Multiple logistic regression analysis showing factors associated with male were more likely to have higher abdominal obesity and alcohol use >50 years, government employee. With smoking, male have more chances of smoking and Age group of 20 to 30 years and 31 to 40 years.

Conclusion: The study showed a high burden of tobacco use and alcohol use among men, inactivity and overweight among women and low fruit and vegetable consumption among both sexes. Enforcement of laws against use of tobacco and alcohol should be made more stringent. More information, education and communication activity regarding promotion of physical activity and balanced diet.

Keywords: NCD; WHO STEPS questionnaire; DALY; Risk factors

Introduction

The burden of non-communicable disease is escalating at an alarming rate. With the advancement in technology, there is a rapid transition in the pattern of disease from communicable disease to Non-Communicable Disease (NCD). It is mainly because of urbanization and economic improvement, which led to a sedentary lifestyle like increased food consumption, tobacco-use, and decreased physical activity [1]. The 4 main types of NCDs globally threatening are cardiovascular diseases, cancers, chronic respiratory diseases and diabetes. NCDs have common risk factors such as tobacco-use, unhealthy diet, physical inactivity, and excess adiposity. Policies and programs focusing on reducing the burden of these common risk factors are likely to make a substantial impact on mitigating the mortality and morbidity due to NCDs [2]. Whereas Non-Communicable

Diseases (NCDs) contributed 60.2% of deaths and 43.1% of global burden of disease in the year 2002, and by 2022 NCDs are expected to contribute 73% of deaths and 60% of disease burden [3].

WHO has released a report which states that every 4th Indian dies from an NCD before the age of 70 years. Nearly 60 percent of deaths are from NCDs and totally 5.8 million die every year due to NCDs [4]. The alarming burden of NCDs is due to the rising prevalence of behavioral and metabolic risk factors associated with it. The risk factors for non-communicable disease are grouped into 3 categories: Behavioral, metabolic and biochemical risk factors. Behavioral risk factors include tobacco use, alcohol use, unhealthy diet and lack of physical activity. Metabolic risk factors include overweight, obesity, diabetes and hypertension. Biochemical risk factors include hypercholesterolemia and hypertriglyceridemia [5].

It is essential to establish surveillance systems for prevention and minimizing the risk factors of non-communicable diseases. WHO developed the WHO's STEPS approach as a part of a global surveillance strategy in response to the growing need for country-level trends in non-communicable diseases [6]. It focuses on a minimum number of risk factors that predict the burden of major non-communicable diseases. This information was used in planning for strategies regarding disease prevention by risk factor reduction [7].

The major impact of NCDs in India is premature loss of life. Recent researches states that NCDs accounted for 52.8% of the total mortality and 44.3% of Disability-Adjusted Life Years (DALYs) lost in 2005 which may increase to 67% of the total mortality by 2030 [8]. Industrialization, urbanization, economic development has accelerated over the past decade which leads to changes in diet and lifestyle of rural populations. Effective preventive measures, including control risk factors like tobacco, alcohol, obesity, blood pressure, diet and physical inactivity are much needed. For NCDs, information on disease burden and distribution of risk factors among the population is the key information required for the planning of prevention and control programs. The information on risk factors predicts the future burden of diseases and is also useful to measure the effectiveness of prevention programs [9]. Hence the present study was planned to find out the prevalence and risk factors of common non-communicable diseases with clear objectives of:

1. To estimate the prevalence rate of non-communicable disease risk factors among the study population.

2. To determine the association between behavioral and metabolic risk factors among the study population.

Material and Methods

This was a community based cross sectional study conducted on a period of November 2020 to June 2021. Total sample size was 1,500 and data were collected through a predesigned, pretested semi-structured modified version of WHO STEPS questionnaire. Due to limited resources, biochemical analysis (STEPS 3) was not conducted. STEPS 1 included information on age, sex, education, marital status, tobacco use, alcohol consumption, consumption of fruits, vegetables and physical activity. In STEPS 2 height, weight, waist circumference and blood pressure were measured. A face-to-face interview was performed using the questionnaire. All the participants of above 20 years and up to 70 years were included in the study whereas pregnant and lactating patients, psychiatric patients and those who were

severely ill were excluded from the study.

Data analysis was done by SPSS V19.0. Descriptive statistics were expressed in frequencies and percentages. Chi square test was applied to assess the association of different variables. P<0.05 was considered statistically significant. Multiple logistic regression analysis was applied to identify the risk factor association with demographic profile. Those variables which were found to be significantly associated with NCD risk factor by using Chi square test and Fisher exact test were only used as predictor variables in multiple logistic regression analysis. The study was carried out after obtaining ethical clearance from the institutional ethical committee.

Result and Discussion

Table 1 show the demographic details of the participants in the study, where the total number of respondents were 1,500. Among them, 65.4% were male and 34.6% were females. It was observed that 37.3% of the participants were of the young age group and 44.7% participants studied up to secondary school. However, 52% were not involved in any occupation at the time of this research.
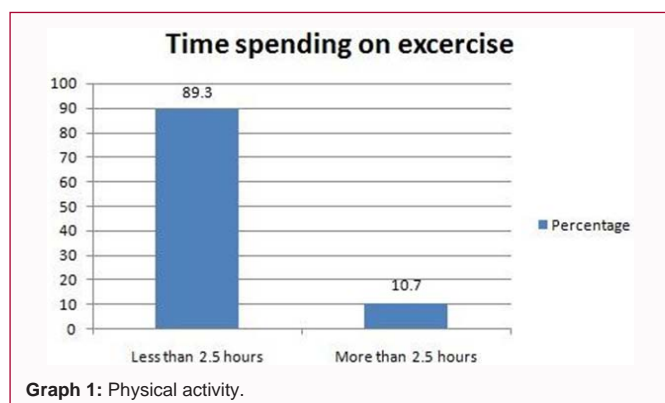
Table 2 shows that the different behavioral risk factors have a definite association with demographic profile. It was observed that tobacco is consumed either in the form of smoking or chewing. Here 26% of the respondents were found to have a smoking habit. Among the subjects, 33% started smoking in the early age group. Majority (68%) of the participants have the habit of tobacco intake. 36% of respondents were having the habit of alcohol consumption. However, 29.3% of respondents started drinking habits after 19 years of age. In the case of physical activity only 10.7% of respondents were engaged in the active physical activity whereas the majority of respondents 89.3% were not physically active. From the obtained data it is clear that most of the respondents 68% were eating healthy in terms of vegetable intake whereas in terms of fruits intake only 11.3% of

Table 1: Socio-demographic characteristics of the study population.

Socio demographic variables	Frequency (n=1500)	Percentage (%)
Age		
20-30	560	37.3
31-40	380	25.3
41-50	240	16
>50	320	21.3
Sex		
Male	981	65.4
Female	519	34.6
Literacy		
Illiterate	230	15.3
Literate	180	12
Primary school	320	21.3
Secondary school	670	44.7
Higher secondary & above	100	6.6
Job status		
Homemaker	780	52
Unskilled labor	370	24.7
Skilled labor	140	9.3
Govt. employee	80	5.3
Self-employee	130	8.7

Table 2: Behavioral risk factors of non-communicable diseases.

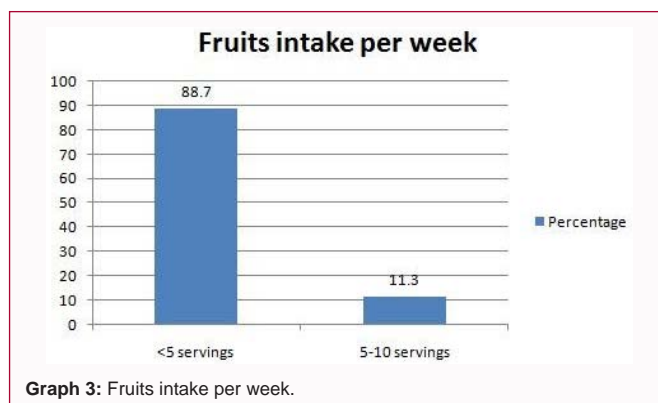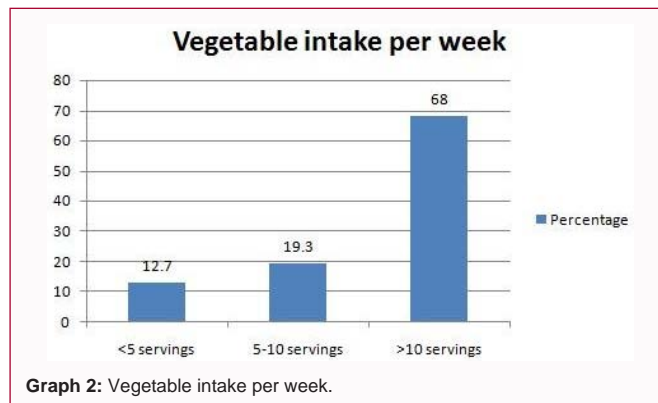| Tobacco consumption		Frequency (n=1500)	Percentage (%)
Smoking	Yes	390	26
	No	1110	74
Age of starting of smoking	<19	130	33.3
	>19	260	66.7
Chewing tobacco products	Yes	102	68
	No	48	32
Alcohol consumption			
Alcohol intake	Yes	540	36
	No	960	64
Age of starting alcohol (in years)	≤ 19	100	6.7
	>19	440	29.3
Exercise			
Exercise in hours	<2.5	1340	89.3
	>2.5	160	10.7
Vegetable intake			
Vegetable intake per week	<5 servings	190	12.7
	5-10 servings	290	19.3
	>10 servings	1020	68
Fruit intake			
Fruits intake per week	<5 servings	1330	88.7
	5-10 servings	170	11.3

Graph 1: Physical activity.

people are taking 5 to 10 servings of fruits.

Research conducted by Arif Habib et al. observed in his study that physical inactivity is one of the most important detrimental factors that lead to NCD as it declines psycho physical health. In this modern era, due to technological advancement and economic growth, globally people are less active. This leads to obesity in adults as well as children. Regular physical activity not only prevents NCD but also improves the blood circulation and pumping effect of the heart (Graph 1).

Also, unhealthy diet has a great impact on NCD. Processed food contains high amount of Tran's fat, saturated fats, sugar, salt which are associated with increased risk of HTN, DM and cholesterol level which can lead to CVDs.

In the present study, the intake of vegetables and fruits in our study population were comparatively higher. Dietary habits play an important role in improving health. A good number of Probiotics,

Graph 2: Vegetable intake per week.

Graph 3: Fruits intake per week.

antioxidants and vitamins are necessary for the proper functioning of the body (Graph 2, 3).

Consumption of tobacco in any form is a peril to health. Because its intake can cause different types of cancer, CVDs, lung diseases which are severely fatal and causes increased risk of premature death.

The magnitude of various behavioral risk factors was analyzed using odds ratio and confidence interval. Fad diets and irregular meal patterns are also associated with non-communicable disease. Obesity was found to be a contributing factor that leads to NCDs.

Conclusion

Tobacco and alcohol use were the two major risk factors of non-communicable diseases in this population. A strong negative behavior was the low level of physical activity among this population which could be the reason for obesity and hypertension. Unhealthy diets were more prevalent among the illiterates which could be resolved by better education. Awareness on the harmful effect of tobacco on health was higher and treatment and control of hypertension was lower probably due to inadequate access to health care.

Enforcement of laws against use of tobacco and alcohol should be made more stringent. More information, education and communication activity regarding promotion of physical activity and balanced diet.

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