

Community Based Study to Assess the Prevalence of Risk Factors for Non-Communicable Diseases in Amarpur Village Up, India- Using Who Step 1 Approach

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ABSTRACT

Background: Non-communicable diseases has led to several deaths worldwide especially in lower income countries. The aim was to assess the prevalence of risk factors for NCDs and find out the association between demographics and behavioral risk factors.

Methods: Descriptive cross-sectional study, multi-stage random sampling technique, sample size 159 and WHO standardized structured questionnaire was used. SPSS version 21 software to calculate percentages, frequencies and chi-square test to assess the association between behavioral risk factors and socio-demographic variables.

Results: Prevalence of tobacco use 37.1%, alcohol consumption 33.3%, unhealthy diet 41% and physical inactivity 37.1%. The demographic variables were associated with the behavioral risk factors at $P < 0.05$.

Conclusion: NCD risk factor prevalence is high due to Low level of education and poor background. However, adopting various health care modifications and change lifestyle choices is necessary to prevent the increasing burden of diseases.

Keywords: Alcohol consumption, Non-communicable diseases, Physical inactivity, Unhealthy diet.

Introduction

Background

Non-communicable diseases (NCDs) are the leading cause of death and are responsible for 70% of deaths worldwide and they affect both women and men almost equally. According to World Health Organisation status, 56.9 million global deaths that occurred in 2016, 40.5 million, or 71%, were due to non-communicable diseases (NCDs). The main four diseases associated with NCDs are cardiovascular diseases, cancers, diabetes and chronic lung diseases and they account to about 36 million out of 57 million of deaths worldwide [1].

The burden of these diseases is increasing at a faster rate especially in lower income country populations. In 2016, over 3 quarters of NCD deaths occurred in low- and middle-income countries with forty sixth of deaths occurring before the age of seventy in these countries. The major disease which accounts for most NCD deaths is cardiovascular disease with about 17.9 million people annually, followed by cancers (9.0 million), respiratory diseases (3.9million), and diabetes (1.6 million) [1].

In India, a total number of 58,17,000 deaths were recorded from diseases like cancer, diabetes and heart problems in 2016. Although the percentage of deaths from NCDs in India is lower compared to many other countries across the world, experts are concerned that the burden is rapidly rising because of change in lifestyle and environmental factors like pollution [2].

The main four risk factors responsible for NCDs are tobacco, unhealthy diet, physical inactivity and harmful use of alcohol. Other major metabolic factors associated with the risk factors are

obesity, and raised blood pressure, blood glucose and blood cholesterol levels. Cardiovascular diseases like (coronary heart disease, stroke, and hypertension) contribute to about 45% of all NCD deaths, followed by chronic respiratory disease (22 %), cancer (12 %) and diabetes (3%). Even though, despite India having a lower percentage of deaths from NCDs, the level at which premature deaths occur due to such diseases is very high. Cancer, diabetes and cardiovascular diseases alone account for 55% of the premature mortality in India in the age group of 30 -69 years annually.

Recent data from WHO shows that almost 23% are at risk of premature death due to NCDs[2]

Although NCDs are the major killer diseases in the world, they can also be preventable through eliminating the major risk factors and implementing effective interventions that address shared risk factors like tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol. NCDs push many people into poverty due to catastrophic expenses for treatment and they have a huge impact on reducing productivity. Non-communicable diseases do not only pose as a health problem but as well as a development challenge. The WHO has warned countries, including India, against premature deaths due to NCDs and recommends governments to step up efforts immediately. [3]

NCDs contribute to around thirty-eight million (68%) of all the deaths globally and to about 5.87 million (60%) deaths in India. Uttar Pradesh has India's second-highest mortality rates that contributes to the largest share of almost all communicable and non-communicable disease deaths [10]. Recent studies show evidence that there is need to put the approach in practice in a rural area setting like Amarpur village since there is no available data/study that has been done in that area regarding prevalence of non-communicable diseases and their risk factors. The information can be used to plan for and implement currently available interventions to address the disease patterns caused by these risk factors. The objectives of the study were to assess the prevalence of risk factors for non-communicable diseases and to find out the association between the demographic variables and behavioral risk factors.

Estimates projects that mortality rates for non-communicable diseases (NCDs) by the year 2020 will account for about 73% of deaths and 60% of disease burden globally. India admits the epidemiological transition which is leading to increase in the prevalence of NCDs. Resuscitating the risk factors for NCDs is recognized as an important preventive strategy. [5]

Operational Definitions

World Health Organisation Surveillance Step 1 approach

The World Health Organisation Surveillance Step 1 approach is a system for NCD risk factors which is set up to assess demographic variables and behavioral risk factors such as tobacco use, alcohol consumption, unhealthy diet and physical inactivity. The Steps Approach focuses on obtaining core data or information at each level on the established risk factors that determine the major disease burden. [6]

Non-communicable diseases (NCDs)

NCDs also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental and behaviour factors. The four main types of non-communicable diseases are cardiovascular diseases (like heart attacks and stroke), cancer, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma) and diabetes. [8,9]

Behavioural risk factors

- Tobacco users- Using of smokeless tobacco like chewing tobacco and smoking like cigarettes etc.
- Alcohol consumption–Consuming any form of alcohol like beer, wine, spirits, whiskey and local alcohols
- Unhealthy diet -A diet with low or no consumption of fruits and vegetables; eating less than 4 servings of fruits and vegetables in a week.
- Physical inactivity -Low physical activity with moderate less than 150 minutes of physical activity per week

MATERIAL&METHODS

Study Design

The research study was based on a descriptive cross-sectional study.

Duration of Study

The study timeframe is 6 months from December 2018 to May 2019

Study Setting

Amarpur a medium sized village located in Gautam Buddha Nagar Tehsil of Gautam Buddha Nagar district, Uttar Pradesh with total 266 families residing. The Amarpur village has population of 1587 of which 827 are males while 760 are females as per Population Census 2011. [20]

Sample Size

Cross-sectional Sample size calculation formula [40]

$$n = \frac{z^2 \times p(1-p) / e^2}{1 + [z^2 \times p(1-p)] / e^2 N}$$

Where:

- Z is the confidence level,
- e is the desired level of precision (i.e. the margin of error),
- p is the (estimated) proportion of the population which has the attribute in question,
- q is 1 – p.
- N is the population size

Population family size = 266, Confidence level = 95% (1.96),
Margin of error or precision = 5% (0.05) P value= 0.5

Sample Size = 158 Rounding off to 159

Sampling Technique

Multi-Stage Random Sampling using systematic Random and Sampling formula (N/n) Where; N = Total number of population, n = Total number of families. Population size= 1587, No of families= 266, $1587/266= 5.9$ Rounding off to 5, Thus every 5th family was selected for identifying adult population between the age of 18-65 years. Simple Random sampling for selection of start point from 1st to 5th family by ballot. Simple Random Sampling for selection of 3 participants in each family above the age of 18 years old by ballot, hence a total number of 53 families was included in the study.

Inclusion Criteria

The study included individuals in the age group of 18-69 years, individuals willing to participate in the study. Residents of the study area who have lived in the area for more than 6 months.

Exclusion criteria

Age group below 18 years, pregnant women and psychiatric individuals, individuals not willing to participate in the study. Non-residents of the study area and families that have lived in the area for less than 6 months.

Study Variables

Dependent Variables-Tobacco users, alcohol consumers, unhealthy diet, physical inactivity
Independent Variables-Gender, age group, education, income
Data collection tool

Data collection from the study area using World Health Organisation (WHO) standardized closed/open structured questionnaire, a STEP 1 surveillance approach containing socio-demographic factors and behavioral risk factors.

Data collection procedure

Participant were identified between the age of 18-65 years old, they were informed about the purpose and benefit of the research before Initiation of the study. Participants gave informed consent before data collection.

Data Analysis Procedure

After the completion of data collection, data was analyzed using Statistical Package for Social Sciences (SPSS) version 21 software. Descriptive data analysis was used to calculate percentages, frequency and chi-square test to assess the significant association between behavioral risk factors and socio-demographic variables.

Ethical Consideration

The study was conducted after getting approval from the Institution of Ethics Committee, Noida International University and from the village head where the study took place. The chosen participants of the study were told about the importance and purpose of the research study and informed consent was given before initiation of data collection

RESULTS

Social-Demographic Characteristics of The Study Population

Table 1; Social-demographic characteristics of the study population

Social-demographics	Variables	Frequency (n=159)	Percentage (%)
Sex	Male	85	53.5
	Female	74	46.5
Age	18-25	37	23.3
	26-33	58	36.5
	34-44	39	24.5
	45-65	25	15.7
Education	No formal schooling	49	30.8
	Primary	44	27.7
	school Secondary	53	33.3
	school UG/PG	13	8.2

Income	Rs500-10000	88	55.3
	Rs10001-20000	58	36.5
	Rs20001-30000	12	7.5
	Rs30001-40000	1	6

Social-demographic characteristics of the study population

The social-demographic characteristics of the study population illustrated in table 1 show that 53.5% were male and 46.5% were female. Among the study population, the age group between 26-33 years had the highest percentage with 36.5% followed by the age group between 34-44 years with 24.5%. About 55.3% had an income of 500-10000 rupees per month in a household, followed by 36.5% with 10001-20000 rupees, 7.5% with 20001-30000 rupees and 6% with 30001-40000 rupees' monthly income.

FINDINGS RELATED TO THE PREVALENCE OF RISK FACTORS FOR NON-COMMUNICABLE DISEASE IN AMARPUR VILLAGE APRIL 2019

Table 2; Prevalence of risk factors for non-communicable diseases among the study population.

Behavioral risk factors	Frequency (n=159)	Percentage (%)
Tobacco Use	59	37.1
Alcohol Consumption	53	33.3
Unhealthy Diet	66	41
Physical Inactivity	59	37.1

Prevalence of risk factors for non-communicable diseases among the study population.

As shown in table 2, the prevalence of behaviour risk factors for the study population are tobacco use with 37.1%, alcohol consumption with 33.3%, unhealthy diet 41% and physical inactivity with 37.1%.

FINDINGS RELATED TO THE ASSOCIATION BETWEEN GENDER AND BEHAVIORAL RISK FACTORS

Table 3; Association between gender and behavioral risk factors

Demographics	Variables	Risk factors				Chi-square	P-value
GENDER		Tobacco Use					
		Yes	No				
	Male	53	30			54.052	0.000
	Female	6	67				
		Alcohol consumption					
	Male	47	36			43.008	0.000
	Female	6	68				
		Fruits Intake					
		0	1-3	4-7	Don't know		
	Male	56	20	5	4	6.873	0.076
	Female	43	26	0	5		
		Vegetable Intake					
		1-2	2-3	3-4	5-7		
	Male	21	47	12	5	1.327	0.723
	Female	14	47	10	3		
		Physical Inactivity					
	Male	27	55			4.083	0.253
	Female	14	47				

Association between gender and behavioral risk factors

The association between behaviour risk factors and gender among the study population as shown in table 3. It depicts that, there is a strong significant relation in smoking tobacco

with $p=0.000$, alcohol consumption with $p=0.000$, fruits intake with $p=0.076$ and physical inactivity with $p=0.253$. But there is no significant relation between gender and vegetables intake.

FINDINGS RELATED TO THE ASSOCIATION BETWEEN AGE AND BEHAVIORAL RISK FACTORS

Table 4; Association between age and behavioral risk factors

Demographic	Variables	Behavioral risk factors		Chi-square	P-value
AGE		Smoking Tobacco Use			
		Yes	No		
	18-25	14	22	6.360	0.703
	26-33	22	35		
	34-44	11	27		
	45-65	12	13		
		AlcoholConsumption			
	18-25	12	25	5.527	0.786
	26-33	22	34		
	34-44	10	29		
	45-65	9	16		
		FruitsIntake			
	19-25	18	14	9.558	0.387
	26-33	37	17		
	34-44	29	8		
	45-65	15	7		

		VegetablesIntake		Chi-square	P-value
18-25		7	22		
26-33		16	35		
34-44		8	24		
45-65		4	13		
		PhysicalInactivity		Chi-square	P-value
18-25		9	28		
26-33		14	42		
34-44		12	25		
45-65		6	17		

Associationbetweenageandbehavioralriskfactors

Table 4 illustrates that there is no association between tobacco use, alcohol consumption, physical inactivity and age but there is a significant association between age and fruits intake with $p=0.387$. A much higher association is seen between vegetables intake and age with $p=0.270$.

FINDINGSRELATEDTOTHEASSOCIATIONBETWEENEDEDUCATIONANDBEHAVIORALRISKFACTORS

Table5; Associationbetweeneducationandbehavioralriskfactors

Demographic	Variables	RiskFactors		Chi-square	P-value
EDUCATION		Smoking			
		Tobacco			
		Use			
		Yes	No		

IlliterateP	19	30		6.002	0.740	
primarySec	13	29				
ondary	23	29				
UG/PG	4	9				
AlcoholConsumption						
IlliterateP	14	34		15.501	0.078	
primarySec	14	30				
ondary	19	34				
UG/PG	6	6				
Fruitsintake						
0 1-34-7Don't know						
IlliterateP	37	8	3	2	20.109	0.107
primarySec	27	18	0	1		
ondary	29	17	1	6		
UG/PG	8	3	2	0		
VegetablesIntake						
1-2 3-33-4 5-7						
IlliterateP	12	28	6	3	10.213	0.334
primarySec	6	32	6	0		
ondary	13	28	7	5		
UG/PG	4	6	3	0		
PhysicalInactivity						
IlliterateP	9	37		11.623	0.235	
primarySec	15	27				
ondary	11	41				
UG/PG	6	7				

Associationbetweeneducationandbehavioralriskfactors

Table5showsthatthereisasignificantassociationbetweeneducationandalcoholconsumptionwithahig herp=0.078,fruitsintakewithp=0.107,vegetablesintakewithp=0.334and physical inactivity with p=0.235. There was no association between smoking tobacco useandeducation.

FINDINGS RELATED TO THE ASSOCIATION BETWEEN INCOME AND BEHAVIORAL RISK FACTORS

Table 6; Association between income and behavioral risk factors

Demographic	Variables	RiskFactors				Chi-square	P-value
INCOME		SmokingTobacco					
		Yes	No				
	500-10000	31	56			13.834	0.128
	10001-20000	24	33				
	20001-30000	04	07				
	30001-40000	00	01				
		AlcoholConsumption					
	500-10000	28	58			4.706	0.859
	10001-20000	23	35				
	20001-30000	02	10				
	30001-40000	00	01				
		FruitsIntake					
		0	1-3	4-7	Don't know		
	500-10000	63	21	1	3	23.506	0.005
	10001-20000	31	22	2	3		
	20001-30000	04	03	2	3		
	30001-40000	01	00	0	0		
		VegetableIntake					
		1-22-33-45-7					
	500-10000	22	51	12	3	5.560	0.783
	10001-20000	11	35	09	3		
	20001-30000	02	07	01	2		
	30001-40000	00	01	00	0		
		PhysicalInactivity					
		Yes	No				

500-10000	21	63	7.232	0.613
10001-20000	16	41		
20001-30000	03	41		
30001-40000	01	00		

Association between income and behavioral risk factors

The association between income and behaviour risk factor as shown in table 6, smoking tobacco use had $p=0.128$ and smokeless tobacco use with $p=0.530$. Fruits intake had $p=0.005$ and there is no relation between alcohol consumption, vegetable intake and physical inactivity.

DISCUSSION

Non-communicable diseases (NCDs) are currently replacing communicable diseases that were the major leading cause of death in most countries. Now non-communicable diseases are the leading cause of death worldwide [1]. Non-communicable diseases are affecting the entire globe especially in developing countries, where the social-demographics and economic transition imposes double burden of non-communicable diseases [22]

The prevalence risk factors of tobacco use (smoking) in this study was found to be (37.1%) with frequency $n=159$ (59) among the study population which was high due to psychological factors, low level of education, peer pressure from communities and changing lifestyles which is similar to the global status report on non-communicable diseases given by World Health Organisation 2014. The impact of these factors are resulting into various diseases leading to high increase in morbidity rates and mortality rates as well as high level of environmental pollution leading to environmental degradation which is highly affecting the population at large. This is based on the global report on health risks given by World Health Organisation 2009 [23,24]. The prevalence findings of tobacco use in this study were in contrast with the study done by Thankappan et al with results (28%) which had a high burden of tobacco use compared to the studies that was done in the United States [25].

Alcohol consumption was prevalent in this study having (33.1%) with a frequency ($n=159$) (53) which is similar to studies done by Kumar et al that revealed a high burden of alcohol with (47.22%) [26]. A comparable alcohol level was seen to be more prevalent especially in poor populations which is evident and much higher in the studies done by S. Bhattacharjee et al with (50.87%) [27,28]. A recent study done by Parry et al shows evidence that there is a strong link between alcohol and non-communicable diseases, in particular cancer, stroke and heart disease, liver disease, pancreatitis and diabetes [29].

The prevalence of unhealthy diet from this study population was recorded to be (41%) for both male and female that is inclusive of both fruits and vegetables intake which is higher comparable to the study done by Srivastav which revealed unhealthy diet to have 9.6% for males and 19.0% for females. [2]

Physical Inactivity prevalence results from the study was (37.1%) with frequency ($n=159$)

(41) which is very high compared to the study done by Vijayakarhikeyan [10]. The study done by Lee et al show strong evidence that physical inactivity increases the risk of many adverse health conditions, including major non-communicable diseases such as coronary heart disease, type 2 diabetes, breast and colon cancers, and shortens life expectancy [30]

The study population highlighted the association between behavioral risk factors and gender among the study population to have an association in smoking tobacco with $p=0.000$, alcohol consumption with $p=0.000$, fruits intake was recorded with $p=0.076$ and physical inactivity with $p=0.253$. A strong association was seen between age and alcohol consumption with a higher $p=0.078$, fruits intake with $p=0.107$, vegetables intake with $p=0.334$ and physical inactivity with $p=0.235$. Education had an association with alcohol consumption of $p=0.078$, fruits intake with $p=0.107$, vegetables intake with $p=0.334$ and physical inactivity with $p=0.235$.

The association between income and behaviour risk factor was seen in smoking tobacco use with a $p=0.128$ and Fruits intake has a $p=0.005$. The results in this study were similar to the studies done by Patrick et al which had an association between physical inactivity and obesity with $P=0.093$ at 95% and Satia et al which had nutrition levels association with overweight with variance at 2% and 17% [31,32]. Another study done by Simantov et al, gender was strongly associated with increased risk for alcohol use in adolescent boys who were drinking regularly with (95% CI, 1.1-5.4) [33]

CONCLUSION

The prevalence of most of the risk factors that was used in the study were generally high across the sociodemographic groups. The reason for the increase was due to low level of education and poor social-economical background which resulted in a high risk for the habit of smoking, alcohol consumption, physical inactivity & unhealthy diet. [28] Because of the high prevalence levels of the various behavioral risk factors, there is need to address these issues by adopting various health modifications and lifestyle choices that will help reduce or combat the disease burden among the study population and across the world at large. The results highlighted the need for carefully and close monitoring, evaluation and control of these non-communicable disease risk factors in rural areas of India.

PUBLIC HEALTH IMPLICATION

The study was aimed to assess the prevalence of risk factors for NCDs and find out the association between demographic variables and behaviour risk factors. The public health significance of this study is to promote health by creating awareness about the dangers of smoking and alcohol consumption as well educating the people about the benefits of physical activity and eating a diet with more of vegetables and fruits. It can also help reduce the rate of morbidity and mortality by assessing the disease burden in the communities. Analyzing and identifying the factors causing or responsible for various diseases occurring in the communities can help make the environment free of pollution. Another health implication of the study is to assess and evaluate the economic development and literacy level of the study population.

LIMITATION OF THE STUDY

- Language barrier was the major limitation of the study as the research was conducted in a rural area setting where Hindi was the local language and there was need to hire translator since the questionnaire was in English language.
- Lack of financial funding and limited time hence only step 1 of the WHO surveillance approach was employed.
- Due to strong cultural beliefs among the study population, many people refused to participate in the study.
- Transportation to the study area was limited.

RECOMMENDATIONS

- Ultimately, low level of education was the reason for the high increase in tobacco use, alcohol consumption and physical inactivity. Hence the government, NGOs, charity institutions and Humanitarian agencies should collaborate and initiate interventions to address these issues like Information Education and Communication (IEC) campaign to educate people about the harmful effects of tobacco use and alcohol consumption in communities as well as teach them the importance of physical activity.
- Policy for an intervention study should be encouraged for future researches, according to this study finding. The prevalence for the behaviour risk factors were high as well as the association between the demographic variable and smoking tobacco use, alcohol consumption, unhealthy diet and physical inactivity. Hence after the IEC is given and monitored, an experimental study may be explored for example a pre and post test to examine the effect, cause and extent of change for probable solutions.
- Poverty was the main reason to which people had unhealthy diet, hence donations can be put up to help the people in such situation. Health campaigns can also be exercised to educate people about the benefits of a balanced diet. Majority of the people were unemployed; therefore, effort can be made in the creation of jobs so as to give them a source of income.
- A similar study can be replicated in the same area using the other WHO surveillance approach step 2,3 assessing the physical measurements and metabolic factors.

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 40. <https://www.surveymonkey.com/mp/sample-size-calculator/>

Table 1. Lorem ipsum dolor sit amet

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Subtopic

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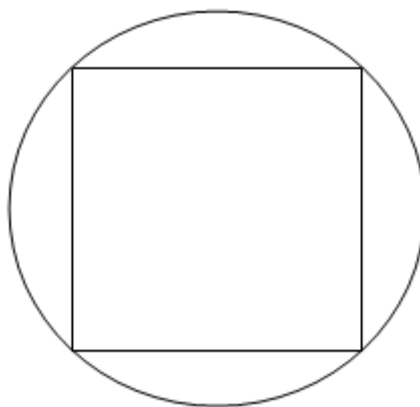


Figure 1. Sed decore meliore scripserit

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Methods (Times New Roman, bold, 12)

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Methodology (Times New Roman, bold, 12)

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Data Analysis(Times New Roman, bold, 12)

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Results (Times New Roman, bold, 12)

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Discussions (Times New Roman, bold, 12)

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Conclusion(Times New Roman, bold, 12)

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Limitations and Future Studies (Times New Roman, bold, 12)

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Acknowledgement (Times New Roman, bold, 12)

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