

Socio-demographic profile and risk factors of non-communicable diseases in Warangal, Telangana: Epidemiological study using WHO stepwise approach

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Abstract

Background: Non-communicable disease (NCD) is a medical condition of non-infectious and non-transmissible nature. NCDs may be chronic diseases of long duration and slow progression. This study was carried out to assess the socio-demographic profile and risk factors of non-communicable diseases using WHO stepwise approach among adults.

Methods: A cross-sectional study was carried out among 400 adults during the period from 1st September 2015 to 31st August 2016. Study tools included a WHO stepwise approach questionnaire, Sphygmomanometer, weighing scale, non-stretchable tape and stethoscope. The data was entered and tabulated in MS-Excel 2007 and statistical analysis was performed by using Statistical Package for the Social Sciences (SPSS 22.0) and $p < 0.05$ is considered as statistical significance.

Results: Majority belonged to 50-59 years, of which 280 (70%) were illiterates. About 319(79.8%) were married, most of them resided in nuclear families with 350 (87.5%). Many were engaged in unskilled labor mainly agricultural activities with 196(49%) and unemployment 113(28.3%). Majority was from upper lower class, followed by lower class.

Conclusion: Proportion of tobacco smoking among the study participants was 123(30.8%) in which 118(29.5%) were males and the association between smoking and gender was statistically significant. Alcohol use (59.5%) which was high among the rural population of Wardhanapet, in which males consume more amount of alcohol than females and these difference present at significant levels. Overall physical activity is high among the study participants as heavy workers were found to be (28.8%) and these differences with gender were present at significant level.

Keywords: Adults, non-communicable disease, risk factors, socio-demographic profile

Introduction

Cardiovascular diseases (including heart diseases and stroke), Diabetes, Cancers and Chronic respiratory diseases (including chronic obstructive pulmonary disease (COPD) and asthma) are the non-communicable diseases. These four non-communicable diseases (NCD) are caused to a large extent by four modifiable behavioural risk factors: tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol. In 2008, 63% (36 to 57 million) deaths worldwide occurred due to NCDs. These deaths were distributed widely among people from

high income to low income countries ^[1].

About one-quarter of all NCD deaths were below the age 60, amounting to approximately 9 million deaths per year. Around 90% of premature deaths from NCDs occur in developing countries. Nearly 80% of NCD deaths (29 million) occur in low and middle income countries. The leading causes of NCD deaths in 2008 were Cardiovascular diseases (17million deaths or 48% of NCD deaths); Cancers (7.6 million or 21% of NCD deaths); and Respiratory diseases, including asthma and COPD (4.2 million).Diabetes caused an additional 1.3 million deaths. NCD deaths are projected to increase by 15% globally between 2010 and 2020 (to 44 million deaths) and annual NCD deaths are projected to rise substantially to 52 million by 2030 ^[2-3].

It is projected that over the next 20 years; annual infectious disease deaths will decline by around 7 million, but annual Cardio-vascular disease mortality will increase by 6 million and annual Cancer deaths by 4 million. By 2030, in low and middle income countries, Non-Communicable Diseases will be responsible for three times as many Disability Adjusted Life Years (DALYs) and nearly five times the mortality from Communicable diseases, as well as from maternal and perinatal conditions and nutritional deficiencies combined ^[4]. In view of this, the present cross sectional, community based, single-center study was carried out to assess the socio-demographic profile and risk factors of non-communicable diseases using WHO STEPUP approach among adults.

Materials and Methods

This cross sectional, community based, single-center study was conducted among 400 adults at Department of Community Medicine, Kakatiya Medical College and Hospital, Warangal, Telangana, India. The study period was of 12 months from 1st September 2015 to 31st August 2016. Four hundred cases with age population in range of 20-59 years and residing in rural field area of Wardhanapet were included in the study. However, pregnant women, bed ridden and paralytic persons, persons who refused to participate in the study, persons in <20 years and >59 years age group, persons who were not present at the time of study and persons who don't have at least 1 risk factor of Non communicable disease (NCD) were excluded from this study.

Study tools included a WHO stepwise approach ^[5] questionnaire, Sphygmomanometer, weighing scale, non-stretchable tape and stethoscope. Study variables for assessment included age, gender, educational status, occupation, economic status, tobacco use, alcohol consumption, dietary habits, history of hypertension and diabetes, physical activity and physical measurements like height, weight, BMI, WHR etc. All The study protocol was performed in accordance with the principle of the declaration of Helsinki and after approval by the Institutional Ethical Scientific Committee.

Statistical analysis: The data was entered and tabulated in MS-Excel 2007, and statistical analysis was performed by using Statistical Package for the Social Sciences (SPSS 22.0). Data had been summarized as mean for numerical variables and count and percentages for categorical variables. Relevant statistical tests were applied and $p < 0.05$ is considered as statistical significance.

Results

Table 1: Socio-demographic profile of the study participants (n=400)

Socio-demographic Profile	Male	Female	Total
1. Age in years			
20-29 years	24 (6%)	07 (1.8%)	31 (7.8%)
30-39 years	46 (11.5%)	17 (4.3%)	63 (15.8%)

40-49 years	80 (20%)	53 (13.3%)	133 (33.3%)
50-59 years	97 (24.3%)	76 (19%)	173 (43.3%)
Total	247 (61.8%)	153 (38.3%)	400 (100%)
2. Religion			
Hindu	355 (88.8%)		
Muslim	07 (1.8%)		
Christian	38 (9.5%)		
3. Type of the family			
Nuclear family	350 (87.5%)		
Joint family	48 (12%)		
Three generation family	02 (0.5%)		
4. Educational status			
Illiterate	280 (70%)		
Primary school	24 (6%)		
Middle school	34 (8.5%)		
High school	25 (6.3%)		
Higher/secondary	23 (5.8%)		
Degree	10 (2.5%)		
Post-graduate	04 (1%)		
5. Occupation			
Professional	02 (0.5%)		
Semi-professional	05 (1.5%)		
Clerical	02 (0.5%)		
Skilled	25 (6.3%)		
Semi-skilled	57 (14.3%)		
Unskilled	196 (49%)		
Unemployment	113 (28.3%)		
6. Socio-economic status (modified B. G. Prasad classification)			
upper class	07 (1.8%)		
upper middle	42 (10.5%)		
lower middle	53 (13.3%)		
upper lower	170 (42.5%)		
Lower	128 (32%)		
7. Marital status			
Married	319 (79.8%)		
Unmarried	81 (20.2%)		

Demographic distribution with respect to parameters like gender-specific, age-specific, Religion, type of family, educational status, type of occupation, socio-economic status and marital status of the study participants have been shown in Table 1. The age group of 50-59 years was found to be predominant in our study group. In this age-group, around 24.3% and 19% of cases belonged to males and females respectively. A total of 355 (88.8%) cases belonged to Hindu religion. Majority of the study population (87.50%) belonged to nuclear family. Illiteracy was the highest factor (70%) among the study population. Close to half of the study population (49%) were unskilled labors. Around 170(42.5%) belonged to upper lower as per Socio economic status (modified B. G. Prasad classification). Around 319(79.8%) of the study population was married.

Table 2: Distribution of cases according to family history and consumption of different substances

Study parameters	No. of cases	Percentage
1. Family history of medical conditions		
Heart disease	10	2.50%
Stroke	06	1.50%

Cancer	09	2.30%
Hypertension	68	17%
Diabetes mellitus	31	7.80%
2. Tobacco smoking		
Yes	118 (29.5%)	5 (1.3%) 123 (30.8%)
No	129 (32.3%)	148 (37%) 277 (69.3%)
Total	247 (61.8%)	153 (38.3%) 400 (100%)
$\chi^2 = 87.87; df=1; p<0.000$		
3. History of past smokers		
Past smokers	Male	Female Total
Yes	28 (7%)	10 (2.5%) 38 (9.5%)
No	219 (54.7%)	143 (35.7%) 362 (90.5%)
Total	247 (61.7%)	153 (38.2%) 400 (100%)
$\chi^2 = 2.53; df=1; p=0.11$		
4. Alcohol consumption	Male	Female Total
Yes	181 (45%)	57 (14.3%) 238 (59.5%)
No	66 (16.5%)	96 (24%) 162 (40.5%)
Total	247 (61.4%)	153 (38.2%) 400 (100%)
$\chi^2 = 50.8; df=1; p<0.000$		
5. History of past alcohol users	Male	Female Total
Yes	82 (20.5%)	17 (4.2%) 99 (24.7%)
No	165 (41.2%)	136 (34%) 301 (75.2%)
Total	247 (61.7%)	153 (38.2%) 400 (100%)
$\chi^2 = 27.30; df=2; p<0.000$		
6. Frequency of alcohol consumption	No. of cases	Percentage
Regular users	126	31.5%
Occasional users	112	28%
Total	238	59.5%
7. Frequency of consuming alcohol in a week by regular users in rural area		
Daily	185	46.30%
5-6 days/week	08	2%
3-4 days/week	75	18.90%
1-2 days/week	131	32.80%
8. Frequency of fruits consumption by regular users in rural area		
Daily	02	0.50%
5-6 days	11	2.80%
3-4 days	57	14.30%
1-2 days	129	32.30%
< day	121	30.30%
Nil	80	20%
9. Frequency of vegetables consumption by regular users in rural area		
Daily	45	11.30%
5-6 days	54	13.50%
3-4 days	111	27.80%
1-2 days	107	26.80%
< day	49	12.30%
Nil	34	8.50%
10. Mean values for fruits and vegetables consumption		
Variable	Mean(SD)	Range
Mean number of days fruits consumed	2.52±1.95	0-7
Mean no. of servings of fruits consumption / day	1.38±0.55	1-3
Mean number of days vegetables consumed	4.76±2.16	0-7
Mean number of servings of vegetables consumption per day	1.97±0.28	1-4

11. Type of cooking oil consumption by regular users in rural area		
Palm	158	39.50%
Sunflower	173	43.30%
Groundnut	68	17%
Mustard	01	0.20%

Distribution of cases according to family history and consumption of different substances by the study participants have been shown in Table 2. Majority (17%) had history of hypertension followed by (7.8%) with history of diabetes mellitus. Percentage of tobacco use was (29.5%) among males and (1.3%) among females and this difference was found to be statistically significant ($p < 0.000$). Mean age of initiation of smoking among study population was 15.97 years, and the mean age of initiation of smokeless form among study population was 22.32 years. Percentage of past smokers was (7%) among males and (2.5%) among females and this difference was found not to be statistically significant ($p = 0.11$). Prevalence of current alcohol users among total study population were found to be (59.5%) of which among men the proportion was (45%) and among women it was (14.3%) and alcohol consumption were high among males when compared to females and they were statistically significant. Most of the rural study population was using brandy, toddy, gudumba and beer. Percentage of past alcohol use was (20.5%) among males and (4.2%) among females and this difference was found to be statistically significant ($p < 0.000$). Among the study population those who consume alcohol, (31.5%) were regular alcohol users and (28%) were occasional users. Among those one fourth of the women and all men consume alcohol. Higher proportions of daily alcohol users were found to be more in rural areas (46.3%). The mean number of days of alcohol consumption in rural areas for regular users it was 5.3 ± 2.5 per week and for occasional users it was 1.8 ± 0.4 per month. Only (0.5%) of study population consuming fruits daily, (32.3%) consume fruits 1-2 days, (30.3%) consume < 1 day and (20%) don't eat fruits. Only (11.3%) consuming vegetables daily, (27.8%) consume vegetables 3-4 days. (12.3%) consume only < 1 day and (8.5%) don't eat green leafy vegetables. The mean value of fruits consumed was 2.52 ± 1.95 and servings per day was 1.38 ± 0.55 . The mean value of vegetables consumed was 4.76 ± 2.16 and servings per day were 1.97 ± 0.28 respectively. Majority (43.3%) was using sunflower oil for their cooking purposes followed by palm oil (39.5%).

Table 3: Distribution of study population according to parameters of work

Nature of work	No. of cases	Percentage	
Sedentary	173	43.30%	
Moderate	65	16.30%	
Heavy	161	40.30%	
Nature of work in relation with gender	Male	Female	Total
Sedentary workers	84 (21%)	90 (22.5%)	174 (43.5%)
Moderate workers	56 (14%)	15 (3.7%)	71 (17.7%)
Heavy workers	107 (26.7%)	48 (12%)	155 (38.8%)
Total	247 (61.75%)	153 (38.2%)	400 (100%)
$\chi^2 = 25.66$; $df=2$; $p < 0.000$			

Distributions of study population according to parameters of work have been tabulated in Table 3. Majority (43.3%) were leading sedentary life style followed by (16.3%) were involved in moderate intensity work and (40.3%) involved in heavy work. Among the study subjects (26.7%) of males and (12%) of females were heavy workers. And about half (43.5%) of the study participants were sedentary workers. The association between gender and nature

of work was found to be statistically significant ($p < 0.000$).

Table 4: Distribution of study population according to medical conditions

History of hypertension		No. of cases	Percentage	
Hypertensive		221	55.3%	
Normotensive		179	44.7%	
History of diabetes				
Yes		111	27.8%	
No		289	72.2%	
History of cardiac pain				
Yes		38	9.5%	
No		362	90.5%	
History of CVA				
Yes		14	3.5%	
No		386	96.5%	
History of Cancer				
Yes		4	1%	
No		396	99%	
History of hypertension in relation with gender				
History of hypertension		Male	Female	Total
Hypertensive		118 (29.5%)	103 (25.8%)	221 (53.3%)
Normotensive		129 (32.2%)	50 (12.5%)	179 (44.7%)
Total		257 (61.75%)	153 (38.25%)	400 (100%)
$\chi^2 = 16.98; df=3; p < 0.001$				
Levels of measured blood pressure		Frequency	Percentage	
Normal (<120/90mm Hg) normal		52	13.0	
Pre-hypertension (120-139/80-90mm Hg)		127	31.7	
Stage 1 (140-159/90-99 mm Hg)		118	29.5	
Stage 2(>160/>100 mm Hg)		103	25.7	
Total		400	100.0	
Mean systolic and diastolic blood pressure levels among the study participants				
Blood pressure		Mean	Range	
Systolic BP		137.20	80-210 (130)	
Diastolic BP		87.05	60-130 (70)	
History of diabetes mellitus with relation to gender				
History of diabetes		Male	Female	Total
Yes		66 (16.5%)	45 (11.3%)	111 (36%)
No		181 (45.2%)	108 (27%)	289 (72.2%)
Total		247 (61.75%)	153 (38.25%)	400 (100%)
$\chi^2 = 0.369; df=2; p=0.832$				
Distribution of the study population according to BMI				
BMI options		Frequency	Percentage	
<18.5 (underweight)		34	8.5%	
19.5-24.9 (normal)		230	57.5%	
25-29.99 (over weight)		91	22.8%	
30-34.99 (obese I)		33	8.3%	
35-39.99 (obese II)		10	2.5%	
>40 (obese III)		02	0.5%	
Distribution of the study population according to waist hip ratio in relation with gender				
Waist hip ratio		Male	Percentage	
<0.9		229	57.2%	
>0.9		18(4.5%)		

Waist hip ratio	Female	Percentage
<0.85	121	30.2%
>0.85	32(8%)	
Mean values of height, weight, waist circumference and BMI among the study population		
Mean values	Mean(SD)	Range
Height	162.28±8.35	132-183
Weight	62.53±12.28	35-98
Waist circumference	85.13±11.29	60-124
BMI(kg/m ²)	23.78±4.60	13.67-39.12
Distribution of the study population with combined risk factors		
Number of combined risk factors	Frequency	Percentage
0	03	0.70%
1	27	6.70%
2	128	32%
3	142	35.50%
4	58	14.50%
5	20	05%
6	02	0.50%

Majority 221(55.3%) were hypertensive and 179(44.7%) were normotensive. Majority (72.2%) do not have history of diabetes and (27.8%) were with history of diabetes, 14(3.5%) with history of CVA and 38(9.5%) with history of cardiac pain/chest pain. 4(1%) of the study participants were with history of cancer. The Table 4 shows the relation of hypertension with gender where (29.5%) of males and (25.8%) of females were hypertensive. The association between hypertension and gender was found to be statically significant ($p < 0.001$). Among the study population, (13%) are normotensives, (31.7%) were in pre hypertensive stage, (29.5%) were in stage 1 hypertension; (25.7%) were in stage 2 hypertension respectively. The mean systolic blood pressure was 137.20 mmHg and mean diastolic blood pressure was 87.05 mmHg respectively. Among the study participants (16.5%) of males and (11.3%) of females have history of diabetes. And the association between them are not statistically significant. More than one fourth (34.1%) were found to be overweight/obese ($BMI \geq 25 \text{ mg/kg}^2$) and (66%) were found with normal BMI ($\leq 25 \text{ mg/kg}^2$). It was observed that (57.2%) males are with $WHR < 0.9$, (4.5%) with > 0.9 and (30.2%) of females are with $WHR < 0.85$, (8%) with > 0.85 . The mean value of height was 162.28 ± 8.35 ; weight was 62.53 ± 12.28 ; and waist circumference was 85.13 ± 11.29 and BMI was 23.78 ± 4.60 respectively. Nearly (35.5%) with 3 combined risk factors; (32%) with 2 risk factors; (0.7%) of the study population was with no risk factor.

Discussion

In the study, there is predominance of 50-59 years age group among other age groups. 31% are within 20-29 years which is similar to DLHS-4⁶ (2012-13) survey in Telangana which was reported with 28.9%. In the present study, majority 88.8% were Hindus as study area includes more Hindu population. Similar results are reported in DLHS-3^[7], the majority of the households were Hindus (85.8%). In the study, 87.5% were from nuclear family and the results of the study found to be contrast with the results from Basu G *et al.*^[8] which reports 42.6% from nuclear family. The results found to be quite similar to the study done by Mehan MB *et al.*^[9] which reports 84.5% were from nuclear family. Among the study population, most of the study participants quit schooling at the high school level and go for labor works to earn livelihood to support their family, in which 280(70%) were illiterates and 9.3% completed higher education, in contrast to other studies conducted by Kaur P *et al.*^[10] study found 7.2% completed primary education, 47.3% with secondary education and 45.5% with

higher education. According to NFHS-4 (2015-2016) ^[11] reported that, literacy rate in Telangana district in rural areas in was males (76.5%) and females (52.4%). The result of the study was found to be in contrast to the result from IDSP-NCD risk factor survey (2007-2008) ^[12] reports. According to S.E.S outlook 2016 Telangana State ^[13], reported that literacy rate in rural area was 57.3% and type of education in relation to HDI in Warangal is 55%.

Among the study population 49% with unskilled labor followed by un-employment with 28.3% as there is an apparent shift from agricultural works to daily wage labor for their livelihood and most of the women were homemakers doing the household works. According to S.E.S outlook 2016 Telangana state ^[13] reported that the largest number of work force (48.8%) is reported to be self-employed in rural areas and un-employment in rural areas is 1.1. The results found to be quite similar to the study conducted by Basu G *et al.* ^[8] reports that 10.8% with un-employment, 33.8% unskilled and 8.2% with skilled labor.

Attained level of education as an indicator for their socioeconomic position (SEP), the results of this study revealed that the burden of non-communicable diseases risk factors is unequally distributed among different SEP classes within the population of wardhanapet. Disease prevention and control strategies should therefore be target-specific and among the study population 42.5% belong to upper lower class and 32% belong to lower class. According to S.E.S outlook 2016 Telangana survey ^[13] reported that, per capita expenditure of Warangal is 63%; 88% per capita in relation with HDI and health, so purchasing capacity has increased. So, NCDs burden also increased.

The prevalence of tobacco smoking among study population was 30.8%. Out of 400 study participants, 118(29.5%) males and 1.3% in females were current tobacco users. The association between gender and current tobacco users was found to be statistically significant. Similar results reported by Thankappan KR *et al.* ^[14] that the prevalence of tobacco use was 24.3% in Kerala. Chow C *et al.* ^[15] also reported that the prevalence of smoking was 20% in rural India.

In our study, 59.5% study population were consuming alcohol of which 45% were males and 14.3% were females, and the difference is found to be statistically significant. Similar results were shown by NFHS-4 (2015-16) ^[11] where prevalence of alcohol consumption in Telangana rural areas is 61.2% among males and 14.3% among females. The result of the study was found to be in contrast to the result from IDSP-NCD risk factor survey (2007-2008) ^[12] reports, where the prevalence of alcohol consumption (current drinkers) was 20%. Thankappan KR *et al.* ^[14] stated that, the prevalence of alcohol use was 15.4% in Kerala and similar results were found in Kokiwar PR *et al.* ^[16] where prevalence was 15.9%.

In our study, higher proportions of alcohol users were found to be regular users (31.5%) and the mean number of days was 4.3 ± 2.5 per week and for occasional users mean number of days was 1.3 ± 0.4 per month. As IDSP-NCD risk factor survey ^[12] reported that, average number of standard drinks consumed on a drinking day was 3 drinks in Andhra Pradesh. Among the study participants fruits and vegetable servings less than five are 88.5% and 86.5% respectively. About 32.3% consume fruits 1-2 days and 27.8% consume vegetables 1-2 days. Mean number of days consumed was 2.52 ± 1.95 and vegetables was 4.76 ± 2.16 respectively. Similar results were found by IDSP-NCD risk factor survey ^[12] reported that, 88% of respondents were consuming less than five servings of fruits and vegetables per day (90% in rural areas in Andhra Pradesh). These results are similar to the study by Deepa M *et al.* ^[17], the proportion of subjects who never consumed fruits (in the last week) were 24% in urban, 29% peri-urban and 41% in rural area and Sugathan TN *et al.* ^[18] in Kerala, reported that, 87% were not in a habit of taking fruits adequately (at least one day) and 13.8% were not taking vegetables at least once daily.

Kinra S *et al.* ^[19] reported that, low fruit and vegetable intake was seen in 69% in men and 75% in women. Among the study population 43.3% use sunflower oil for their cooking purposes and 39.5% use palm oil. The study population consume mainly of saturated fats/oils.

Similar results were found in IDSP-NCD risk factor survey ^[12] reported that, use of ground nut oil (34.6% in urban; 27.3% in rural), Sunflower oil (32.6% in urban; 12.9% in rural), Palm oil (29.8% in urban; 56.1% in rural) was common in Andhra Pradesh. In the study done by Agarwal VK *et al.* ^[20] reports 47% of the study population consume saturated fats/oils. Majority of the study population were leading sedentary life style (43.3%) in which 21% were males and 22.5% were females. 16.3% with moderate intensity work and 40.3% heavy workers and these difference is found to be statistically significant. Similar results were found in the study conducted by Mehan B *et al.* ^[9] and Sugantham TN *et al.* ^[18]. Similarly study done by Ahmed SM *et al.* ^[21] where >70% of rural population had three or more risk factors for chronic NCDs among selected Asian population. Everyone in the study subjects had at least one risk factor present. This is a clear evidence of mounting NCD burden among the rural population. Though they had access to mass media in most of these settlements, their level of awareness on treatment and control of chronic diseases were still low and most of the rural population were not utilizing the health system properly because of difficulty in access, increased waiting time to see the doctor, lack of medicines in the primary health centre, lack of facilities in the primary health centre and the transportation cost. This was quite similar to the study done by Singh LP *et al.* ^[22] in tribal groups of Rajasthan reported that the tribes lost their trust in the health system.

Conclusion

Majority belonged to 50-59 years, of which 280 (70%) were illiterates. About 319(79.8%) were married, most of them resided in nuclear families with 350 (87.5%). Many were engaged in unskilled labor mainly agricultural activities with 196(49%) and unemployment 113(28.3%). Majority was from upper lower class, followed by lower class. Proportion of tobacco smoking among the study participants was 123(30.8%) in which 118(29.5%) were males and the association between smoking and gender was statistically significant. Percentage of overall alcohol use (59.5%) which was high among the rural population of wardhanapet, in which males consume more amount of alcohol than females and these difference present at significant levels. The physical activity among the sedentary workers was found to be (43.5%) but overall physical activity is high among the study participants of wardhanapet as heavy workers was found to be (28.8%) and these differences with gender were present at significant level.

Limitations

In this study, all the risk factors and WHO Step-III approach (Lipid profile, RBS,) could not be included in the study. Only 20-59 years age group was included so as to study the secondary prevention, geriatric age group was excluded, even though burden of disease is high in this age group. Mental health (NIMHAMS steps questionnaire) are not studied. Because of feasibility, less number of questions from WHO STEPS approach questionnaire was taken up for this study.

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