

ORIGINAL ARTICLE

Shared Risk Factors of Non-Communicable Diseases: A Community based Study among Adults in an Urban Resettlement Colony of Delhi

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Abstract

Introduction: As urbanisation is increasing, the problem of communicable as well as non-communicable diseases (NCDs) is also increasing. Hypertension, diabetes, obesity, cardiovascular diseases constitute most of the NCDs whose risk factors are almost similar. They could be modifiable like physical activity, waist circumference, diet, smoking, alcohol intake. **Objective:** To study the magnitude of shared risk factors for Non-communicable diseases in adults of an urban resettlement colony of Delhi. **Material and Methods:** A cross sectional survey was conducted on adults >30 years (n=580) in both genders in an urban resettlement colony of Delhi in 2014. A Semi-structured interview schedule consisting of Socio-demographic characteristics, risk factor profile was used. Data was entered and analyzed in SPSS 12. **Results:** Out of the total 580 subjects (313)53.96% were women and 267(46.03%) were men. Majority 405(69.8%) of the study subjects were taking inadequate fruits and vegetables (<5 times/day) and 212 (36.6%) were taking >5 gm salt per day. About 181(31.2%) of the study subjects were sedentary workers, the proportion was more among women 99(31.6%). 223(83.5%) men had waist circumference within normal limits whereas 178 (56.9%) women had waist circumference more than 88 cm. One in four men were smokers. Nearly 49(18.4 %) of the men were current tobacco chewers as compared to 17(1.6%) of women. Only 33 (12.4%) men were currently consuming alcohol. Results of multiple logistic regression showed increasing age, education and marital status as significant socio demographic factors for increased prevalence of risk factors for NCDs. **Conclusion:** Promotion of lifestyle change to address these risk factors that can be modified including weight reduction, increased physical activity and healthy eating should be encouraged along with changing of behavioural factors like quitting smoking and alcohol. **Keywords:** NCDs, Adults, Diabetes mellitus, Hypertension, Risk factors, Delhi.

Introduction

As the world is moving in 21st century and in the next phase of urbanisation and development, the problem of communicable as well as non-communicable diseases (NCDs) is also increasing day by day. NCDs are a group of gradually progressing, largely preventable diseases of long duration that are responsible for various morbidities and mortality. NCDs like cardiovascular diseases, cancers, diabetes and chronic respiratory diseases are currently the leading causes of death and disability globally. In India, NCDs were responsible for 53 per cent of deaths and 44 percent of disability.¹ They cause an estimated 8.5 million deaths each year in South East Asia region, with half of these deaths being premature and among

productive citizens aged 30-70 years. In India, nearly 38% of the population stays in urban areas whose lifestyle and dietary changes are side effects of being in urban areas.² Hypertension, diabetes, obesity, cardiovascular diseases constitutes most of the NCDs who share common risk factors either modifiable like physical activity, waist circumference or non-modifiable such as increasing age or family history. The diagnosis, treatment and management of disease as well as its complications are life threatening and expensive but at the same time, are preventable if taken into account at the right time. The premature deaths and disability can be decreased through implementation of cost effective, affordable and proven health policies that enable and promote healthier life style.

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Objective

To study the magnitude of shared risk factors for Non-communicable diseases in adults of an urban resettlement colony of Delhi.

Material and Methods

The present community based cross sectional study was conducted in an urban resettlement colony of East Delhi, Kalyanpuri to assess the common risk factors of Non-communicable diseases in an adult population (>30years) during January 2014 to December 2014. Both government and private health care agencies cater to the health care needs of the residents. Using the prevalence of obesity in the study done in north with same settings, the sample size came was 566.¹⁹ Kalyanpuri, an urban resettlement colony had total 11 blocks numbering 11 to 21. Out of these, 5 blocks i.e. block 11, 12, 16, 18, 20 were selected using simple random sampling. Proportionate numbers of houses were identified by Population proportional to size sampling in each block. Permanent residents of Kalyanpuri (residing >1year) were included and 586 subjects gave consent to participate in the study. Six subjects were excluded as they were pregnant. Thereby, the final sample size was 580.

Information regarding shared risk factors for Non-communicable diseases was obtained from study subjects using a Semi-structured interview schedule consisting of

a) Socio-demographic characteristics: Age, gender, marital status, education, occupation, religion, family type and total family income. Socio economic status was calculated by modified Kuppuswamyscale.

b) Risk factor profile: The shared risk factors for Non-communicable diseases are physical inactivity, unhealthy diet, smoking, alcohol use, stress etc. A detailed interview was taken to assess the various risk factors of for Non-communicable diseases:

- Physical activity was measured using GPAQ (Global Physical Activity Questionnaire) by WHO.
- Dietary assessment was done by collecting information regarding intake of fruits and vegetables, dietary fibre, oil intake, salt intake, junk food items.
- Addiction habits regarding smoking, alcohol, substance use were enquired.
- Stress was assessed using General Health Questionnaire 12 (GHQ 12).

Data analysis: Data was entered and analyzed in SPSS version 12. Continuous data was expressed as mean, median, standard deviation, and 95% CI was used. The categorical data was expressed as percentage/proportions

and where ever applicable χ^2 and analysis of variance (ANOVA) after check of normality by Kolmogorov Smirnov were used. Multivariable logistic regression models were constructed relating the significant factors with socio demographic factors. A p value of less than 0.05 was taken as statistically significant.

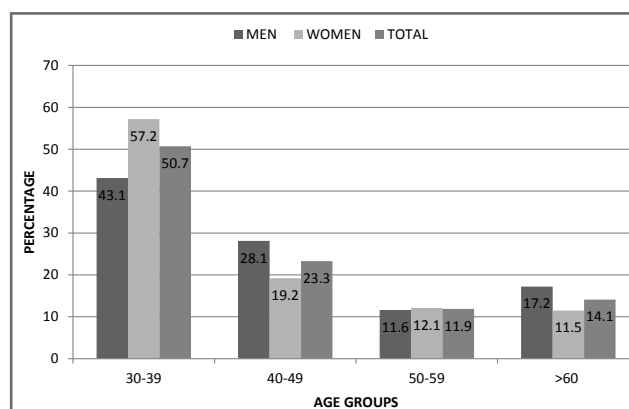
Ethical Issues

Approval was taken from Institutional (Lady Hardinge Medical College) Ethical Committee. A written consent was taken from each study subject. Those who were illiterate, thumb impressions were taken in front of a witness. All information collected was kept confidential. All the study subjects who were found with risk factors were referred to a secondary level hospital/Tertiary level hospital for their further workup.

Results

The present study was conducted in Kalyanpuri, an urban resettlement colony of Delhi. A total of 580 study subjects were recruited. Figure1 shows the age group of the study subjects. The overall mean age was 43.38 (± 11.26) years with a range 30-75 years. The mean age was 44.98 (± 10.89) years and 42.01(± 11.40) years for men and women respectively. Out of the total 580 subjects 53.96% were women and 46.03% were men. Nearly three -fourths of the study subjects belonged to 30-49 age group as seen in figure 1. Table 1 represents the dietary risk factors where majority (69.8%) of the study subjects were taking inadequate fruits and vegetables (<5 times/day) which was almost similar for both men and women. Majority (91.7%) of the study subjects were taking <25 gm /day of saturated fats/oils which was almost similar across gender. Nearly 27% of the subjects were taking >5 gm of salt per day. Table 2 represents the distribution according to physical activity and waist circumference. Majority of the study subjects were moderate workers (62.9%) and about 31.2% of the study subjects were sedentary workers and the proportion was similar among both the gender. Only few 34 (5.9%) were heavy workers, men (7.1%) slightly more than

Fig 1: Distribution of study subjects according to age



women (4.8%). The overall mean waist circumference was 85.48cm (± 7.680) with a range of 67-153cm. It was 84.89 cm (± 6.47) and 85.98 cm (± 8.55) for men and women respectively. More than half of the women 178 (56.9%) had waist circumference more than 88 cm. Majority of the men (83.5%) had waist circumference within normal limits. Table 1 shows the consumption of tobacco, smoking and alcohol. Majority 303(96.81%) women were non-

smokers but one in four men were smokers. 18.4 % of the men were current tobacco chewers as compared to 1.6% of women. Only 33 (12.4%) men were currently consuming alcohol whereas none of the women were currently taking alcohol. Chi-square test showed the significant association between per capita salt consumption/day, behavioural risk factors and waist circumference.

Table 1: Distribution of dietary and behavioural factors among study subjects

Dietary Factors		Gender			χ^2 , df, p value
		Men	Women	Total	
		(n=267)	(n=313)	(N=580)	
		N (%)	N (%)	N (%)	
Consumption of fruits and vegetables/day	<5 times/day	185(69.3)	220(70.3)	405(69.8)	0.068 1 0.7939
	>=5times/day	82(30.7)	93(29.7)	175(30.2)	
Per capita/fat/oil consumption/day	<25gm/day	246(92.1)	286(91.4)	532(91.7)	0.110 1 0.7402
	>=25gm/day	21(7.9)	27(8.6)	48(8.3)	
Per capita salt consumption/day	<5gm/day	211(79.0)	215(68.6)	426(73.4)	0.005 1 7.893
	>=5gm/day	56(21.0)	98(31.3)	154(26.6)	
Behaviorial Risk Factors					
Smoking	Ex –smoker	58(21.7)	8(2.6)	66(11.4)	159.10 1 0.001
	Current smoker	70(26.2)	2(0.6)	72(12.4)	
	Non smoker	139(52.1)	303(96.8)	442(76.2)	
Smoke-less Tobacco	Ex tobacco chewer	17(6.4)	3(1.0)	20(3.4)	63.58 1 0.0001
	Current tobacco chewer	49(18.4)	5(1.6)	54(9.3)	
	Non tobacco chewer	201(75.3)	305(97.4)	506(87.2)	
Alcohol	Past use of alcohol	35(13.1)	3(1.0)	38(6.6)	78.30 1 0.001
	Current use of alcohol	33(12.4)	0(0)	33(5.7)	
	Never used alcohol	199(74.5)	310(99)	509(87.8)	

Table 2: Distribution of study subjects according to physical activity, BMI and Blood pressure .

Physical Activity		Gender			χ^2 , df, p value
		Men (n=267)	Women (n=313)	Total (N=580)	
		N (%)	N (%)	N (%)	
Sedentary worker		82(30.7)	99(31.6)	181(31.2)	1.410 1 0.2351
Moderate worker		166(62.2)	199(63.6)	365(62.9)	
Heavy worker		19(7.1)	15(4.8)	34(5.9)	
Waist Circumference*					
No Risk		223(83.5)	135(43.1)	358(61.7)	99.492 1 0.0001
Risk Present		44(16.5)	178(56.9)	222(38.27)	
BMI					
Underweight	<18.5	0(0)	5(1.6)	5(0.8)	1.121 1 0.2897
Normal	18.5-24.9	224(83.9)	247(78.9)	471(81.2)	
Overweight	25-29.9	38(14.2)	37(11.8)	75(12.9)	
Obese	>=30	5(1.9)	24(7.7)	29(5.0)	
Blood Pressure					
Normal		149(55.8)	167(53.3)	316(54.4)	0.349 1 0.5547
Pre-hypertensive		41(15.3)	54(17.2)	95(16.4)	
Hypertensive stage I		53(19.8)	67(21.4)	120(20.6)	
Hypertensive stage II		24(8.9)	25(7.9)	49(8.4)	

*male > 90cm ,females> 80 cm : risk present

Table 3: Association of systolic and diastolic blood pressure with age

Blood pressure	Gender	Age	Mean $\pm$ SD	F	P value
Systolic blood pressure	Male	30-39	112 $\pm$ 10	13.962	<0.0001
		40-49	116 $\pm$ 10		
		50-59	126 $\pm$ 15		
		>60	119 $\pm$ 11		
	Female	30-39	114 $\pm$ 10	19.42	<0.001
		40-49	135 $\pm$ 13		
		50-59	126 $\pm$ 15		
		>60	121 $\pm$ 17		
Diastolic blood pressure	Male	30-39	74 $\pm$ 7	4.73	0.003
		40-49	75 $\pm$ 7		
		50-59	80 $\pm$ 9		
		>60	77 $\pm$ 9		
	Female	30-39	73 $\pm$ 7	6.27	<0.0001
		40-49	77 $\pm$ 8		
		50-59	79 $\pm$ 10		
		>60	78 $\pm$ 10		

Comparison of systolic and diastolic BP with ANOVA among different age groups is shown in Table 3. The mean systolic and diastolic BP increased with age in both sexes. At 30-39 and 50-59 age group mean systolic BP was significantly higher in male ($P < 0.001$ in both age group), but at >60 years age group, it was only significant in females. Mean diastolic BP at 30-39 age group in female significantly higher than male ($P < 0.001$), but there was no significant difference between both gender at other age groups. Results of multiple logistic regression analyses are shown in Table 4. Increasing age, education and marital status were found to be significant socio demographic factors for increased prevalence of risk factors for NCDs.

Discussion

The common risk factors for Non-Communicable Diseases are tobacco use, unhealthy diet, physical inactivity and excess adiposity. This study showed high prevalence of these risk factors in the community.

Majority 405 (69.8 %) of the study subjects did not consume the recommended intake of fruits and vegetables that is at least five servings of fruits and vegetables per day, which was similar for both men and women. These findings

Table 4: Multiple logistic regression for associated risk factors for NCDs

Socio demographic variables	Waist Circumference		Smoking		Amount of Salt Per Day	
	Prevalence %	OR(95% CI)	Prevalence %	OR(95% CI)	Prevalence %	OR(95% CI)
Age groups						
30-39	8.6	Referent	2.4	Referent	14.5	Referent
40-49	32.8	4.41(3.87-6.42) *	35.8	1.72(0.78-2.45)	36.2	4.67(3.56-5.28) *
50-59	28.7	3.81(2.44-4.78) *	24.6	1.23(1.06-1.67) *	33.8	3.42(2.55-4.78) *
>60	22.6	2.78(1.65-3.02) *	19.3	0.87(0.67-1.21)	25.6	2.43(1.98-3.66) *
Marital Status						
Married	64	Referent	18	Referent	35	Referent
Widowed	19	0.56(0.35-0.88) *	24	1.01(0.67-1.86)	28	2.56(1.79-3.46) *
Separated						
Unmarried						
Occupation						
Unemployed/ Homemakers	43	Referent	38	Referent	28	Referent
Employed	28	1.67(0.87-2.33)	33	3.21(2.54-4.22) *	17	1.43(0.53-2.00)
Education						
<5 th	38	Referent	26	Referent	35	Referent
>5 th	44	0.50 (0.42-0.60)*	18	1.71 (1.49-1.96)*	25	0.90 (0.36-2.26)
Type of family						
Joint	15	Referent	13	Referent	21	Referent
Nuclear	43	1.84 (1.57-2.26)*	35	1.45(1.11-2.32)*	32	0.78(0.22-2.34)

OR= odds ratio,*P<0.05

are supported by other studies conducted in India^{7,12,14,16,23} and globally.^{13,15,24}

Majority (93.7 %) of the study subjects did not report any family history of diabetes and hypertension. These observations are similar to that conducted by Anand et al, Sadeghi et al and Gupta et al.^{11,13,14} Few Indian studies conducted by Revathi et al and Mohan et al in Kerala and Tamil Nadu reported a higher prevalence of family history of diabetes.^{6,16} This may be due to the fact that the study subjects lacked awareness regarding family history of diabetes. Only 7.2% of the study population, including 8.9% of women and 5.2% of men, reported to be under stress close to the findings of Laskar et al as assessed with General Health Questionnaire-12.¹²

Physical activity was assessed by Global Physical Activity Questionnaire (GPAQ). Almost 3 out of 10 study subjects were sedentary workers which was similar across gender. This is similar to findings of Prabhakaran et al.¹² Majority (62.9%) of the study population was engaged in moderate physical activity which was similar among both males and females while only 5.9% were heavy workers. The findings of our study were concordant to that of Ketkar et al and Gupta et al.^{5,14} Sedentary life style was also reported in studies by Deepa(>50% in both men and women) and

Anand(23.2% of men, 52.4% of women).^{8,11} Laskar et al reported moderate physical activity in around 21 % study subjects while Shah et al found that 42% subjects were engaged in moderate physical activity.^{12,23}

Although majority of women in our study were homemakers they were engaged in moderate physical activity doing all the household chores themselves. Overall the level of physical activity was found to be high in our study population. This is a very encouraging finding in our study and must be promoted at all levels.

In the present study, tobacco consumption was observed to be much less (12.7%) unlike other studies done in various parts of India where this number was almost double.^{6,7,11,15,17}

In our study 52% men and 96% women were non-smokers which is similar to other studies but still it is almost double the number reported by Anand et al.^{8,11}

Alcohol consumption was seen in 21% of men while in other studies, 32% and 28% of men and women were consuming alcohol respectively in studies by Deepa et al & Gupta et al.^{8,14} This might be due to social stigma leading to under-reporting by the study subjects.

Based on the WHO cut-offs, 18% subjects were in pre-obese or obese category similar to that reported by other authors while few authors also reported higher prevalence of obesity in their studies.^{4,5,6,16,18,20,22} Majority (81.2%) of the study subjects had normal weight which was similar across gender. The overall mean BMI was 23.79 (± 3.03) kg/m² and it was almost same among both the genders while in studies done by Laskar, Ravikumar and Shah mean BMI among women was higher than men.^{12,19,23} One hundred and seventy eight (56.9%) women had waist circumference more than 85 cm and 44(16.5%) men had waist circumference >90 cm. These findings were similar to that reported by Gupta et al and F Asgari et al.^{14,24}

A concern in our study sample was the proportion of participants with sub optimal blood pressure. Nearly 44.2% of the participants had high blood pressure (>120/80 mmHg). About 15.3% and 28.7% of the participants had pre-hypertension and hypertension respectively that is increasing with advancing age. The findings of our study are concordant to those reported by Bhalerao.⁹ However Ketkar conducted a study in workplace and reported higher prevalence of pre-hypertensives

(61.5%).⁵ More than half (54.4%) of the study subjects had normal blood pressure which was similar across gender. Increasing age, education and marital status were found to be significant socio demographic factors for increased prevalence of risk factors for diabetes.

Conclusion

In this community based study we have found a high prevalence of risk factors for NCDs which warrants for immediate concerted action. Promotion of lifestyle change to address these risk factors as weight reduction, increased physical activity and healthy eating should be encouraged. Population based screening for common risk factors for all non-communicable diseases needs to be started in this community with regular follow up and action. In view of the high burden of risk factors in this community, it is recommended to start an NCD clinic at Urban health centre Kalyanpuri so that screening of all adults can be done along with health education of the community.

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Conflict of Interest : Nil

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