

Association between Risk Factors of Common Noncommunicable Diseases (Diabetes, Hypertension, and Cardiovascular Diseases) and SocioDemographic Factors in Young Adult Women

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Abstract

Introduction: During the past 50 years, there is a substantial rise in noncommunicable diseases (NCDs) mortality in developing countries. India is also undergoing demographic transitions. Lifestyle which increases the risk of NCDs in younger age group will lead to increase in NCDs burden further in future generation. **Objectives:** The objective of this study is to determine the association between risk factors of common NCDs and sociodemographic factors in young adult women of Palam Village, New Delhi. **Settings and Design:** A community-based cross-sectional study was conducted in Palam Village, New Delhi. **Materials and Methods:** A total of 585 study participants were interviewed using a predesigned, semi-structured questionnaire. Waist circumference, blood pressure (BP), and weight were measured using nonstretchable measuring tape, digital BP apparatus, and digital weighing scale, respectively. Qualitative data are expressed in proportions and Chi-square test is applied. Mean and standard deviation are used for quantitative data. **Results:** As the socioeconomic status improved, the frequency of consuming adequate amount of fruits and vegetables in a day also increased. This association was statistically significant ($P < 0.05$). **Conclusion:** The present study reported varied prevalence of different risk factors with various sociodemographic characteristics and there is an urgent need to implement population, individual, and program wide prevention and control interventions.

Keywords: Noncommunicable diseases, risk factors, socio-demographic factors, young adult women

INTRODUCTION

India is undergoing nutritional, demographic, and socioeconomic transitions, which has created a double burden of communicable and noncommunicable diseases (NCDs). NCDs contribute to 71% of deaths globally. Every 2 s someone aged 30–70 years dies prematurely from NCDs.^[1] In India, 63% of deaths were due to NCDs, out of which 45% were women.^[1] Knowledge of the association of socioeconomic factors and NCDs risk factors at the population level is essential to understand the role of risk factors in the epidemiological transition.^[2] Women and men have different levels of exposure to NCDs risk factors. Due to various social customs, women's opportunities for physical activities are reduced and thus more vulnerable for NCDs.^[3] Adult female mortality can lead to higher mortality among small children, children withdrawn from school, increased work burden on children. Women's

health is, therefore, critically important to the health of future generations.^[4] Most of the studies in the field of NCDs included wide range of age groups ranging from 15 to 60 years, but the study on risk factors among young adult women of 15–24 years of age has rarely been explored. Therefore, the present study was done in a community setting with the objective of identifying the association between risk factors of common NCDs and sociodemographic factors among young adult women of Palam Village, New Delhi.

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MATERIALS AND METHODS

The present study was a community-based cross-sectional study, conducted in Palam Village of New Delhi. It is one of the field practice areas of the Department of Community Medicine, Lady Hardinge Medical College, New Delhi. The study protocol was approved by the Institutional Ethical Committee of Lady Hardinge Medical College. Informed consent was obtained from all the participants and confidentiality was maintained. The study was carried out from November 2017 to March 2019. Data were collected from January 2018 to December 2018. The study population comprised all the women of 15–24 years of age who were permanent residents of Palam Village (residing for more than 1 year). The sample size was calculated by the formula $N = 4pq/l^2$ where p represents the prevalence of obesity (Body mass index >30) which is 14.6% obtained from the previous study done by Thakur *et al.* on Profile of Risk Factors of NCDs in Punjab, Northern India: Results of a State-Wide STEPS Survey. “One” was allowable error, taken as 20% of p . Therefore, a sample size of 585 individuals was taken. Palam village has a population of 12000 and the total number of households is 2400. The sampling unit was household and study unit were young adult women of age 15–24 years. Systematic random sampling was applied with a sampling interval of 4 ($2400/585 = 4$). An area map was made, and the first household was selected randomly, and then every 4th household was visited until the required sample size was obtained. If an eligible participant was not found in the 4th household, then adjacent one was visited. If more than one eligible girl were residing in the same household, then only one was included in the study by random selection.

Information regarding risk factors (Physical inactivity, dietary risk factors, stress, and behavioral risk factors [tobacco and alcohol use]) for NCDs was collected by semi-structured interviews schedule consisting of sociodemographic characteristics, global physical activity questionnaire (GPAQ) by the WHO to assess physical activity level, dietary assessment by predesigned questionnaire, stress assessment using general health questionnaire 12 (GHQ 12), and behavioral risk factors by predesigned questionnaire. Nonstretchable measuring tape, digital weighing scale, portable stadiometer, and digital blood pressure (BP) apparatus were used to measure waist and hip circumference, weight, height, and BP, respectively. Data were coded and entered in Statistical Package for the Social Sciences (SPSS) IBM SPSS version 23.0 (Armonk, NY: IBM Corp. Released 2015). Qualitative data were expressed in proportions and Chi-square test was applied. Mean and standard deviation were used for quantitative data. Suitable tests of significance were applied wherever necessary.

RESULTS

A total of 604 households were visited, and 596 study participants were enrolled. Eleven study participants were excluded from the study (six refused to give consent, and five were pregnant). Hence, the data of 585 participants

were analyzed. The results have been tabulated below. Proportion of women belonging to upper socioeconomic status in the study participants consuming adequate amount of fruits and vegetables was 1.7%, whereas proportion of women belonging to lower socioeconomic status in study participants consuming adequate amount of fruits and vegetables was 2.2%. As the socioeconomic status improved, the frequency of consuming adequate amount of fruits and vegetables in a day also increased. This association was statistically significant ($P < 0.05$) [Table 1]. Of 243 study participants with Waist-Hip circumference Ratio (WHR) ≥ 0.85 , 46.5% participants were from lower-middle socioeconomic status and 40.7% were from upper lower socioeconomic status whereas 0.8% of participants were from upper socioeconomic status. This association was not statistically significant ($P > 0.05$) [Table 1]. Out of 158 study participants who had sedentary lifestyle, 45.5% participants were from lower middle and 44.3% participants were from upper lower socioeconomic status. This relationship between socioeconomic status and level of physical activity was not statistically significant ($P > 0.05$). Of 411 study participants who were consuming inadequate amount of fruits and vegetables in a day, 60.3% belonged to nuclear family and this difference was statistically significant ($P < 0.05$) [Table 2]. About 57.8% of married participants were eating salty food and snacks more than once in a week and this association was statistically significant ($P < 0.05$) [Table 3]. Out of 158 research participants who had sedentary lifestyle, 30.3% were housewives, 29.7% were employed, and 39.8% were students and this difference was statistically significant ($P > 0.05$) [Table 4].

DISCUSSION

Understanding the underlying mechanisms and pathways linking women’s social determinants with avoidable NCD mortality is central to challenge the root causes of health inequities and inequalities.^[5-7] This is mandatory for achieving one of the United Nations Sustainable Development Goals (SDG 3, target 3.4) by the year 2030, as well as the WHO “25 by 25” target by 2025.^[8] The present study identified significant differences in distribution of risk factors of NCDs in young adult women by socioeconomic status, employment status, type of family, and marital status. Proportion of women consuming inadequate fruits and vegetables in a day is higher in joint families (39.6%) as compared to nuclear families (24.7%) and this was found to be statistically significant ($P < 0.05$). Family is a basic unit of society and proximal food environment which has an impact on food choices and dietary behaviors through the mechanisms such as parent role modeling and social norms.^[9] Due to rapid sociocultural changes, especially industrialization, the concept of family has also undergone extreme changes. Moreover, strained relationships between adult and adolescent family members may result in fragmented family eating practices where children avoid family meals and instead choose to eat outside the home or with friends.^[10] One reason of lower fruits and vegetables consumption is lack of

Table 1: Association between risk factors of common noncommunicable diseases (physical activity level, waist-hip circumference ratio, amount of fruits/vegetable consumption in a day) and socioeconomic status

Socioeconomic status	Physical activity level		WHCR		Amount of fruits/vegetables consumption in a day		Total (n=585)
	Sedentary, n (%)	Moderate/heavy worker, n (%)	Risk absent, <0.85, n (%)	Risk present, ≥0.85, n (%)	Inadequate (<5 servings [400 g]), n (%)	Adequate (≥5 servings [400 g]), n (%)	
Upper	1 (0.6)	6 (1.4)	5 (1.4)	2 (0.8)	4 (0.9)	3 (1.7)	7 (1.2)
Upper middle	10 (6.3)	35 (8.1)	30 (8.7)	15 (6.1)	27 (6.5)	18 (10.3)	45 (7.6)
Lower middle	72 (45.5)	187 (43.7)	146 (42.6)	113 (46.5)	179 (43.5)	80 (45.9)	259 (44.4)
Upper lower	70 (44.3)	186 (43.5)	157 (45.9)	99 (40.7)	187 (45.4)	69 (39.6)	256 (43.6)
Lower	5 (3.1)	13 (3.0)	7 (2.0)	11 (4.5)	14 (3.4)	4 (2.2)	18 (3.2)
Total	158 (100.0)	427 (100.0)	342 (100.0)	243 (100.0)	411 (100.0)	174 (100.0)	585 (100.0)
χ^2 , df, P	5.113, 4, 0.623		7.995, 4, 0.092		11.972, 4, 0.017		

WHCR: Waist-hip circumference ratio

Table 2: Association of amount of fruits/vegetables consumption in a day and type of family

Type of family	Amount of fruits/vegetables consumption in a day		Total, n (%)
	Inadequate (<5 servings [400 g]), n (%)	Adequate (≥5 servings [400 g]), n (%)	
Nuclear	248 (60.3)	131 (75.2)	379 (64.7)
Joint	163 (39.6)	43 (24.7)	206 (35.2)
Total	411 (100.0)	174 (100.0)	585 (100.0)

 $\chi^2=11.971$, df=1, P=0.001**Table 3: Association of frequency of eating salty snack and marital status among study subjects**

Marital status	Frequency of eating salty snacks (pickle, papad, and cheese)		Total, n (%)
	<1 day/week, n (%)	≥1 day/week, n (%)	
Married	172 (42.1)	236 (57.8)	408 (69.7)
Unmarried	99 (55.9)	78 (44.0)	177 (30.2)
Total	271 (46.3)	314 (53.6)	585 (100.0)

 $\chi^2=9.421$, df=1, P=0.002

affordability, also evident in our study. Proportion of women belonging to upper socioeconomic status in study participants consuming adequate amount of fruits and vegetables was 1.7%, whereas proportion of the same in study participants consuming inadequate amounts of fruits and vegetables was 0.9%. Proportion of women belonging to lower socioeconomic status in study participants consuming adequate amount of fruits and vegetables was 2.2% whereas proportion of same in study participants consuming inadequate amount of fruits and vegetables was 3.4%. As the socioeconomic status improved, the frequency of consuming adequate amount of fruits and vegetables in a day also increased. This association was statistically significant. This finding is similar to that of a French study "Socio-economic factors associated with an increase in fruit and vegetable consumption: a 12-year study in women from the E3N-EPIC study"^[11] About 57.8% of married participants were eating salty food and snacks more than once in a week than the unmarried participants and this association was found to be statistically highly

significant. Preference for salt taste and Westernized trend of eating processed food could partly explain the high salt consumption. Married women (74%) were more involved in moderate and heavy level of physical activity than unmarried women (26%). This association was statistically significant. Majority of women were homemakers and doing all the household chores themselves. This finding is in agreement with the study done by Abdul Rouf "Physical inactivity and its association with hypertension in adult female population of Srinagar, India: A community based cross-sectional study" in which 73.1% of married women were reported to be involved in moderate and heavy level of physical activity.^[12] However, the study conducted by Ariarathinam Newtonraj *et al.* "Factors associated with physical inactivity among adult urban population of Puducherry, India: A population based cross-sectional study" reported 50.1% of study participants to be physically active.^[13]

In our study, employed women and students were less physically active than housewives (43.5%) in contrast to the findings by Ariarathinam Newtonraj *et al.*^[13]

CONCLUSION

Healthy lifestyle must be promoted in young adult females, who will further inculcate these practices in their families. In our study, there was high proportion of school and college-going students who had sedentary lifestyle. Hence, knowledge regarding healthy lifestyles such as physical activity and healthy diet should be inculcated in students through curriculum and teachers should be trained. Consumption of inadequate

Table 4: Association of physical activity level and employment status of study participant

Employment status	Physical activity level		Total (n=585), n (%)
	Sedentary, n (%)	Moderate and heavy worker, n (%)	
Housewife	48 (30.3)	186 (43.5)	234 (40)
Employed	47 (29.7)	116 (27.1)	163 (27.9)
Students	63 (39.8)	125 (29.2)	188 (32.1)
Total	158 (100.0)	427 (100.0)	585 (100.0)

$\chi^2=21.721$, $df=2$, $P=0.04$

fruits and vegetables in a day was found in majority of study participants. Awareness activities regarding intake of seasonal fruits and vegetables in schools as well as in community should be carried out, which are also relatively cost-effective. There should be a restriction and its strict implementation on selling of street and junk food in premises of schools and colleges to discourage its use. Many of the schools and colleges have already implemented this, but it has to be further strengthened and promoted. Mass media campaigns, taxes on unhealthy food, subsidies on healthy foods, mandatory food labeling, and marketing restrictions on unhealthy food should be done.

One of the strengths of the present study was that it addressed the young adults women. Moreover, being a community-based study, the present study carries more weightage. The sample size was probability sample which was based on statistical formula. Sampling method (Systematic random sampling) was also methodologically correct to ensure representativeness and therefore our study can be generalized to similar setting in same population. Validated questionnaires (GPAQ, GHQ 12), anthropometric and BP measurements using standard procedures and instrument, were used in the study to assess the prevalence of risk factors of NCDs in young adult women. This has reduced the chance of interviewer bias in the study. Due to time constraints and lack of affordability, all factors related to all NCDs could not be assessed, which is a limitation of the present study.

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Conflicts of interest

There are no conflicts of interest.

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