Research Article

Awareness level and associated factors for non-communicable disease screening among adults in rural Puducherry, India

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ABSTRACT

Background: Non-communicable diseases have emerged as a health problem of global priority in recent times. Screening and early diagnosis is important to plan appropriate interventions. **Objectives:** The objectives of the study were as follows: (1) To study the awareness of screening for hypertension (HTN), diabetes, cancer cervix, and cancer breast, (2) to study the status of screening for HTN, diabetes, cancer cervix, and cancer breast, and (3) to study the factors associated with not aware of screening for above non-communicable diseases. **Materials and Methods:** A community-based cross-sectional study was conducted in service practice area of a tertiary care, Puducherry. Adults aged more than 30 years were included by simple random sampling technique. The required sample size was 400. Face-to-face interview was done using semi-structured questionnaire. Basic sociodemographic details, awareness, and status of screening were collected. Data were entered in EpiData Version 3.1 and analyzed in IBM SPSS 17. **Results:** Of 398 study participants, majority (43.2%) belongs to 30–45 age groups. The mean age of the study participants was 49 ± 13 years. The prevalence of self-reported HTN and diabetes in the present study was 24% and 19.8%, respectively. Nearly three-fourth of the study population had awareness of screening for HTN and diabetes. Awareness of cancer cervix screening was very low (35%) when compared to cancer breast (45%). Unmarried and below primary level of education were independently associated with unawareness of screening for non-communicable disease. **Conclusion:** Around 15% and 30% of the study population were never screened for HTN and diabetes, respectively, though the awareness was high, whereas more than three-fourth of the female participants were never screened for cancer breast and cancer cervix though the awareness was <50%. Non-communicable disease screening needs to be targeted more toward young females, those with below primary level of education with low socioeconomic background and elderly people.

KEY WORDS: Awareness; Screening; Non-Communicable Disease; Rural

INTRODUCTION

Non-communicable diseases (NCDs) are the major causes of mortality and morbidity globally. Hypertension (HTN) is directly responsible for 57% of all stroke deaths and 24% of coronary heart disease deaths in India. The WHO rates HTN as one of the most important causes of premature death worldwide.[1] More than half of the people with diabetes remain undiagnosed in both developed and developing countries, and this individual often presents with diabetes complications. Undiagnosed diabetes and pre-diabetes need to be detected and treated early through community-based screening.[2] Cervical cancer is the fourth most common cancer among the women worldwide and the seventh overall. Approximately 87% of the worldwide mortality for cervical cancer occurs in underdeveloped countries.[3] The northeastern districts of Tamil Nadu and Pondicherry have a high proportion of the rural population who had reported a very high incidence of

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cervical cancer. Screening for precancerous lesions reduces the incidence and mortality from cancer cervix. Though the cytology based screening pap smear have been found to be effective in developed countries, an alternative screening methods using Visual Inspection Acetic acid (VIA) or Visual Inspection Lugals Iodine (VILLI) can be used more effectively in low resource settings.[4] Breast cancer accounts for 19–34% of all cancer cases among women in India. The peak occurrence of breast cancer in developed countries is above the age of 50 years as compared to India, where it occurs in a younger age group. Cancer in the young (15–34 years) tends to be more aggressive which is a cause of concern as this denotes the need of educative and awareness programs targeting younger member of the society as early as 18 years, to implement early practices of breast self-examination (BSE) into the lifestyle. There is evidence that women who correctly practice BSE monthly or more likely to detect a lump in the early stage and early diagnosis have been reported to influence early treatment, to yield a better survival rate. By increasing public health awareness activities and use of screening programs, we can detect the disease early.[5]

A majority of the rural population in India have inadequate access to health care. Over half of the outpatient consultations are with indigenous and private practitioners, where regular screening for HTN, diabetes, cervical cancer, and cancer breast is not practiced. Opportunistic screening for above disease will not screen and detect a large proportion of disease; in turn, they will not seek health care from the formal health sector until they become seriously ill. Community-based screening can improve the detection and treatment of NCDs. Studies from various parts of India have assessed the prevalence, awareness, treatment and control of NCDs and stressed upon the importance of early diagnosis by screening tests[6-10], the present study have the novelty and aim to find out the proportion of population who have been aware and undergone screening for HTN, diabetes, cancer breast and cancer cervix and factors associated with unawareness of screening for non-communicable disease. Screening is an important aspect of the management of the disease, as it leads to early diagnosis and treatment and prevents risk of complications and future mortality.

MATERIALS AND METHODS

A community-based cross-sectional study was conducted in service practice area of a tertiary care center, Puducherry, from June to November 2018. Institute Research Committee and Ethics Committee approval were obtained before conducting the study. The tertiary care center serves around 9000 population in rural area. Assuming 50% of adult population had undergone screening for non-communicable disease, 5% absolute precision with 95% confident interval, the estimated sample size was 384. Adults aged more than 30 years were randomly selected and included in the study until we achieved the sample size. Adults both men and women above 30 years were interviewed using the semi-structured questionnaire. Informed written consent was obtained. Basic sociodemographic details, prevalence of HTN and diabetes, factors associated with awareness, and status of screening were collected.

Data Entry and Analysis

Data were entered into EpiData Version 3.1 and analyzed in IBM SPSS 17. Categorical variables expressed in percentages. Continuous variables expressed in mean ± 2SD. Factors associated with not aware of screening were analyzed using bivariate and multivariate logistic regression.

RESULTS

Of 398 study participants, majority (43.2%) belongs to 30–45 age groups. The mean age of the study participants was 49 ± 13 years. More than half (55.8%) of the people had below primary level of education, 56.5% were unemployed and unskilled workers, and 36.7% of persons belong to low socioeconomic class. Nearly three-fourth of the study population had awareness of screening for HTN and diabetes. Awareness of cancer cervix screening was very low (35%) when compared to cancer breast (45%). The prevalence of self-reported HTN and diabetes was 24% and 19.8%, respectively. Nearly one-fourth of the participants had family history of HTN and diabetes. Almost 84.7% of the study participants had undergone screening for HTN and 70.6% had undergone diabetes screening irrespective of awareness. Among females, 15.3% had undergone screening test for cancer breast, whereas only 7.4% of females had undergone screening for cancer cervix.

In Table 1, females are more aware of screening of HTN (73.3%) than the males (72.8%), but statistically there is no significant difference. Lower age group (30–45) is more aware (77.3%) of screening of HTN than other age groups without significant difference. Unmarried (aOR = 2.8 [1.3–6.1]) and below primary level of education (aOR=2.8 [1.6–4.8]) were independently associated with unawareness of screening for HTN.

In Table 2, the difference in awareness for diabetes screening between married (75.3%) and unmarried (48.4%) is statistically significant. People with above primary school education are more aware of diabetes screening (84%) than illiterate and primary (64.4%). This difference is statistically significant. Lower age group (30–45) is more aware (75.6%) than other age groups without any significant difference. Unmarried (aOR = 2.8 [1.3–6.1]) and below primary level of education (aOR = 3.1 [1.8–5.4]) were independently associated with unawareness of screening for diabetes.

Table 1: Factors affecting awareness of screening for hypertension among adults aged more than 30 years in rural Puducherry (*n*=398)

Sociodemographic details	Aware	Unaware	*n* (%)	Unadjusted OR	Adjusted OR	*P* value
Age group (years)						*P*=0.4
30–45	130 (75.6)	42 (24.4)	172 (43.2)	1	1	*P*=0.6
46–60	109 (71.6)	39 (28.3)	148 (37.2)	1.1 (0.6–1.8)	0.8 (0.4–1.3)	
>60	52 (66.6)	26 (33.3)	78 (19.6)	1.5 (0.8–2.7)	0.8 (0.4–1.6)	
Gender						*P*=0.6
Female	148 (72.9)	55 (27.1)	203 (51)	1.0 (0.6–1.5)	0.6 (0.3–1.0)	
Male	143 (73.3)	52 (26.7)	195 (49)	1	1	
Marital status						*P*=0.008
Married	275 (75.3)	90 (24.6)	365 (91.7)	1	1	
Single	16 (48.4)	17 (51.5)	33 (8.3)	3.2 (1.5–6.6)	2.8 (1.3–6.1)	
Educational status						*P*=0.0001
Illiterate and primary	143 (64.4)	79 (35.5)	222 (55.8)	2.5 (1.5–4.1)	2.8 (1.6–4.8)	
Above primary	148 (84)	28 (15.9)	176 (44.2)	1	1	
Occupational status						*P*=0.1
Unemployed and unskilled	155 (68.8)	70 (31.1)	225 (56.5)	1.5 (0.9–2.4)	1.5 (0.9–2.6)	
Semiskilled and skilled	136 (78.6)	37 (21.3)	173 (43.5)	1	1	
Socioeconomic status						*P*=0.1
1–3	183 (72.6)	69 (27.3)	252 (63.3)	1.1 (0.7–1.8)	1.4 (0.8–2.3)	
4 and 5	108 (73.9)	38 (26)	146 (36.7)	1	1	
Total	291 (73)	107 (27)	398			

OR: Odds ratio

Table 2: Factors affecting awareness of screening for diabetes among adults aged more than 30 years in rural Puducherry (*n*=398)

Sociodemographic details	Aware	Unaware	*n*	Unadjusted OR	Adjusted OR	*P* value
Age group (years)						*P*=0.2
30–45	133 (77.3)	39 (22.6)	172	1	1	*P*=0.07
46–60	106 (71.6)	42 (28.3)	148	1.3 (0.8–2.2)	0.9 (0.5–1.7)	
>60	52 (66.6)	26 (33.3)	78	1.7 (0.9–3.0)	0.9 (0.4–1.7)	
Gender						*P*=0.8
Female	149 (73.3)	54 (26.6)	203	1	1	
Male	142 (72.8)	53 (27.1)	195	1.0 (0.6–1.6)	1.8 (1.0–3.1)	
Marital status						*P*=0.001
Married	275 (75.3)	90 (24.6)	365	1	1	
Single	16 (48.4)	17 (51.5)	33	3.2 (1.5–6.6)	2.8 (1.3–6.1)	
Educational status						*P*=0.0001
Illiterate and primary	143 (64.4)	79 (35.5)	222	2.9 (1.7–4.7)	3.1 (1.8–5.4)	
Above primary	148 (84)	28 (15.9)	176	1	1	
Occupational status						*P*=0.06
Unemployed and unskilled	155 (68.8)	70 (31.1)	225	1.6 (1.0–2.6)	1.6 (0.9–2.8)	
Semiskilled and skilled	136 (78.6)	37 (21.3)	173	1	1	
Socioeconomic status						*P*=0.2
1–3	183 (72.6)	69 (27.3)	252	1.0 (0.6–1.7)	1.3 (0.8–2.2)	
4 and 5	108 (73.9)	38 (26)	146	1	1	
Total	291 (73)	107 (27)	398			

OR: Odds ratio

Table 3: Sociodemographic details and its association with unawareness of screening for cervical cancer (*n*=203)

Sociodemographic details	Aware	Unaware	*n* (%)	Unadjusted OR	Adjusted OR	*P* value
Age group (years)						
30–45	28 (34.5)	53 (65.4)	81 (39.9)	1		
46–60	32 (40.5)	47 (59.4)	79 (38.9)	0.7 (0.4–1.4)		
>60	11 (25.5)	32 (74.4)	43 (21.1)	1.5 (0.6–3.5)		
Marital status						*P*=0.6
Married	64 (36.5)	111 (63.4)	175 (86.2)	1	1	
Single	7 (25)	21 (75)	28 (13.8)	1.7 (0.6–4.2)	1.2 (0.4–3.1)	
Educational status						*P*=0.0001
Illiterate and primary	34 (24.8)	103 (75)	137 (67.5)	3.8 (2.0–7.1)	3.5 (1.8–6.9)	
Above primary	37 (56)	29 (43.9)	66 (32.0)	1	1	
Occupational status						*P*=0.3
Unemployed and unskilled	58 (36.7)	100 (63.2)	158 (77.8)	1	1	
Semiskilled and skilled	13 (28.8)	32 (71.1)	45 (22.2)	1.4 (0.6–2.9)	0.6 (0.3–1.4)	
Socioeconomic status						*P*=0.5
1–3	47 (39.4)	72 (60.5)	119 (58.6)	1	1	
4 and 5	24 (28.5)	60 (71.4)	84 (41.4)	1.6 (0.8–2.9)	1.2 (0.6–2.3)	
Total	71 (35)	132 (65)	203			

OR: Odds ratio

In Table 3, women with above primary school education are more aware (56%) of screening for cancer cervix than illiterate and primary (24.8%). This difference is statistically significant. Middle age group women (46–60) are more aware (40.5%) than other age groups, but this difference is not statistically significant. Married women (36.5%) are more aware than unmarried person (25%) without any significant difference. Women in higher socioeconomic status (SES) (Classes 1–3) are more aware (39.4%) than lower SES (28.5%) without any significant difference. Below primary level of education is independently associated with aOR = 3.5 (1.8–6.9) unawareness of cervical cancer screening.

In Table 4, women with above primary school education are more aware (65%) than illiterate and primary (35%) about screening for cancer breast with significant statistically difference. Married women (48%) are more aware than unmarried person (25%) with significant statistically difference. Lower age group women (30–45) are more aware (49.3%) than other age groups without statistically significant difference. Lower SES (Classes 4 and 5) is more aware (49%) than higher SES (42%) without any statistical difference. Being single (OR=2.7[1.1-6.8]) is associated with unawareness about breast cancer screening. Below primary level of education (aOR=4.0[2.0-7.8]) is independently associated with unawareness about breast cancer screening.

DISCUSSION

The prevalence of self-reported HTN and diabetes in the present study was 24% and 19.8%, respectively. Nearly three-fourth of the study population had awareness of screening for HTN and diabetes. Awareness of cancer cervix screening was very low (35%) when compared to cancer breast (45%). Unmarried and below primary level of education were independently associated with unawareness of screening for non-communicable disease.

The prevalence of self-reported HTN in this study shows 24% which is similar to the study from Puducherry and systematic review and meta-analysis from India 2014,[1,11] whereas studies from rural Davanagere, Karnataka and Nagpur show low prevalence of 18% and 15.4%, respectively.[6,12] This difference could be due to rural and urban differences.

In the present study, about 27% of the study participants were not aware of screening for both HTN and diabetes. Overall, 85% of the study populations were screened for their HTN status. More females (99%) were screened for HTN as compared to males (92%). A study from Puducherry reported that 60.8% of the study population was screened for their HTN and more females 68.4% were screened for HTN as compared to males (52%)[11] which is low compared to the present study. The difference may be due to the difference in urban and rural setting. However, a study on screening for HTN among women of reproductive age group, in the U.S. in 2011, reported that 89.6% of the women had received screening for HTN.[13]

Young age group (44.2%), illiterate and primary (56.3%), employed (55.3%), and lower socioeconomic class (52.6%) were more screened for HTN which is contrast to the study done in Puducherry.[11]

Table 4: Sociodemographic details and its association with unawareness of screening for cancer breast (*n*=203)

Sociodemographic details	Aware	Unaware	*n* (%)	Unadjusted OR	Adjusted OR	*P* value
Age group (years)						
30–45	40 (49.38)	41 (50.6)	81(39.9)	1		
46–60	34 (43.03)	45 (56.96)	79 (38.9)	1.2 (0.6–2.4)		
>60	17 (39.53)	26 (60.46)	43 (21.1)	1.4 (0.7–3.1)		
Marital status						0.1
Married	84 (48)	91 (52)	175 (86.2)	1	1	
Single	7 (25)	21 (75)	28 (13.8)	2.7 (1.1–6.8)	1.8 (0.7–4.8)	
Educational status						0.0001
Illiterate and primary	48 (35)	89 (65)	137 (67.5)	3.4 (1.8–6.4)	4.0 (2.0–7.8)	
Above primary	43 (65)	23 (35)	66 (32.5)	1	1	
Occupational status						0.4
Unemployed and unskilled	69 (44)	89 (56)	158 (77.8)	1.2 (0.6–2.3)	1.2 (0.6–2.6)	
Semiskilled and skilled	22 (49)	23 (51)	45 (22.2)	1	1	
Socioeconomic status						0.03
1–3	50 (42)	69 (58)	119 (58.6)	1.3 (0.7–2.3)	2.0 (1.0–3.7)	
4 and 5	41 (49)	43 (51)	84 (41.4)	1	1	
Total	91 (45)	112 (55)	203			

OR: Odds ratio

The prevalence of self-reported diabetes in the present study was 19.8%. There are other studies from various parts of India show the prevalence from 6% to 18.8%.[14-17]

Cervical cancer is the leading female genital cancer in developing countries. This high prevalence rate might be a reflection of the lack of an organized cervical cancer screening program and motivation in the developing countries. The majority of women were in the fourth, fifth, and sixth decades of life. Nearly 15% were young having age <40 years.[4]

In the present study, 34% of women were aware of screening for cancer screening, another study from tertiary care hospital, Puducherry, shows 18% awareness,[4] whereas the study from Kerala shows three-fourth of the study population aware of screening for cervical cancer.[7] This difference could be explained in the difference in educational status in the study settings. Various studies show the awareness level of cancer cervix screening from 2% to 27%.[18-21]

In the present study, 4% of women had undergone screening for carcinoma cervix, this study finding is consistent with the study from tertiary care center, Puducherry,[4] whereas the study from Kerala shows 6.9%.[7] The screening coverage of Indian women in the age group of 18–69 years was 2.6% (4.9% among urban and 2.3% among rural) and was found to vary between 4% and 6% in poor and rich women in India.[22]

In the present study, 45% were aware of screening (BSE), among them 15% had undergone screening for carcinoma breast. Various studies from India show awareness level of 0%–72%.[23-27]

In this study, we found that lack of awareness is a predominant barrier for undergoing screening for cancer cervix and breast followed by ignorance and no complaints, most of the studies revealed that lack of knowledge and awareness, fear of pelvic examination and disease, embarrassment and shy, lack of time, and family support were the important barriers.[28-32]

The strength of the present study is that it was conducted in a rural community with adequate sample size and one of the very few studies assessing the awareness of screening for four major non-communicable diseases. The limitation of the present study is that we assessed only self-reported screening and self-reported cases of HTN and diabetes which were considered for calculating the prevalence. Active screening for HTN, diabetes, cancer cervix, and cancer breast was not undertaken. In future, there is a need of qualitative assessment such as focus group discussion or in-depth interview to address the awareness and barriers for screening.

CONCLUSION

Around 15% and 30% of the study population were never screened for HTN and diabetes, respectively, whereas more than three-fourth of the female participants were never screened for cancer breast and cancer cervix. Diabetes and HTN screening needs to be targeted more toward those with below primary level of education and elderly people. Cancer breast and cervix screening need to be

targeted more toward women with extremes of age group, unmarried, low socioeconomic class, and below primary level of education.

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