RESEARCH ARTICLE

Women's Knowledge, Attitudes, and Practices about Breast Cancer in a Rural District of Central India

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Abstract

Background: Breast cancer accounted for almost 25% of all cancers in women globally in 2012. Although breast cancer is the most prevalent cancer in India, there is no organised national breast cancer screening programme. Local studies on the burden of breast cancer are essential to develop effective context-specific strategies for an early detection breast cancer programme, considering the cultural and ethnic heterogeneity in India. This study examined the knowledge, attitudes, and practices about breast cancer in rural women in Central India. Materials and Methods: This community-based cross sectional study was conducted in Wardha district, located in Maharashtra state in Central India in 2013. The sample included 1000 women (609 rural, 391 urban) aged 13-50 years, selected as representative from each of the eight development blocks in the district, using stratified cluster sampling. Trained social workers interviewed women and collected demographic and socio-economic data. The instrument also assessed respondents' knowledge about breast cancer and its symptoms, risks, methods of screening, diagnosis and treatment, as well as their attitudes towards breast cancer and self-reported practices of breast cancer screening. Chi-square and t-test were applied to assess differences in the levels of knowledge, attitude, and practice (the outcome variables) between urban and rural respondents. Multivariable linear regression was conducted to analyse the relationship between socio-demographic factors and the outcome variables. Results: While about two-thirds of rural and urban women were aware of breast cancer, less than 7% in rural and urban areas had heard about breast self-examination. Knowledge about breast cancer, its symptoms, risk factors, diagnostic modalities, and treatment was similarly poor in both rural and urban women. Urban women demonstrated more positive attitudes towards breast cancer screening practices than their rural counterparts. Better knowledge of breast cancer symptoms, risk factors, diagnosis, and treatment correlated significantly with older age, higher levels of education, and being office workers or in business. Conclusions: Women in rural Central India have poor knowledge about breast cancer, its symptoms and risk factors. Breast self-examination is hardly practiced, though the willingness to learn is high. Positive attitudes towards screening provide an opportunity to promote breast self-examination.

Keywords: Breast cancer - screening - rural - KAP - India

Introduction

Cancer is a major public health problem globally, with an estimated 14.1 million new cases globally in 2012 (International Agency for Research on Cancer, 2012). Worldwide, cancers of the lung, female breast, colon, rectum and prostate and stomach account for almost half of all diagnosed cases (International Agency for Research on Cancer, 2012). While lung cancer is the most common cancer in men (17% of all new cases), breast cancer is by far the most common cancer amongst women, accounting for 25% of all new cancer cases (International Agency for Research on Cancer, 2012).

In 2012, nearly one million new cases of cancer were estimated in India (International Agency for Research on

Cancer, 2012). The incidence of breast cancer (145,000 new cases estimated in 2012) has been increasing, and it has overtaken cervical cancer (123,000 cases estimated in 2012) as the most prevalent cancer in women in the country (International Agency for Research on Cancer, 2012). The India National Cancer Registry Programme (NCRP) shows that breast cancer is the leading cancer in women at present, in 11 out of 13 population-based cancer registries in the country (except the registries at Barshi and Mizoram) (National Centre for Disease Informatics and Research, 2013). There is a statistically significant increase in age-adjusted incidence rates (AAR) in the cancer registries at Bangalore, Bhopal, Chennai, Delhi, and Mumbai from 1982 to 2010. In Bangalore, the annual percentage change (APC) rose from 2.4% in 1982-1999

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to 5.3% in 2003-2009(National Centre for Disease Informatics and Research, 2013). In the Bangalore, Chennai, and Mumbai registries, the significant increase in the AAR was observed in the population of 35 to 44 year olds, while in Delhi the increase occurred in the age group between 45 and 54 years old in Delhi (National Centre for Disease Informatics and Research, 2013).

Despite the availability of epidemiological evidence, mostly from urban registries of a surge in breast cancer cases, the National Cancer Control Programme (NCCP) has not yet developed an organised screening programme. There is wide heterogeneity in breast cancer awareness programmes, which are concentrated in urban areas, but deficient in remote and rural areas. One of the reasons behind this indifference might be the non-availability of credible data on disease burden on breast cancer from rural areas. The only rural cancer register at Barshi within the NCRP still show higher incidence of cervical compared to breast cancer (National Centre for Disease Informatics and Research, 2013).

In 2010, a population based cancer registry was established in Wardha district, in the state of Maharashtra, under the National Cancer Registry Programme, a network of registries funded by the Indian Council of Medical Research. This registry collates cancer cases from both the rural and urban population of the district. Between 2010 and 2012, the average annual incidence of breast cancer cases recorded in this registry was 17.9/100,000 women as compared to 7.9/100,000 women for cervical cancers. The incidence of breast cancer was lower in rural Wardha (15.1/100,000 women) than in urban Wardha (23.6/100,000 women). This clearly shows that trends in breast cancer incidence are changing in India, even in rural areas.

Data from four major cancer centres in India show that majority of women with breast cancers go to health care settings for the first time at late stages (Saxena et al. 2005; Agarwal & Ramakant, 2008). Illiteracy, ignorance, myths and superstitions, as well as financial constraints, lead to delays in seeking medical advice. At present, India lacks an organised breast cancer screening programme (Agarwal & Ramakant, 2008). Mammography is available as an opportunity for diagnosis for women who can afford to pay for it and is restricted to larger diagnostic centres. In 2010, Breast Health Global Initiative experts recommended that countries of low and low-middle resources should establish the prevention of locally advanced tumours as a priority with use of resource appropriate approaches (Anderson et al., 2011). Screening mammography programmes may not be feasible in these settings and alternative strategies for this group may include public awareness programmes, breast self examination and clinical breast examination (Anderson et al., 2011).

Evidence shows that women who seek treatment in the early stages of breast cancer have better chances of survival (Hwang et al., 2013; American Cancer Society, 2014). For detection at an early stage, women must be aware of the disease symptoms and of simple prevention strategies such as breast self-examination. Therefore, it is crucial to understand women's attitudes about breast cancer in order to develop effective strategies for early detection of breast cancer. There is also a need for focused studies in defined geographical regions, since the political, cultural, socio-economic conditions and access to health services are widely divergent among the states. The aim of this study was to examine the knowledge, attitudes, and practices (KAP) regarding breast cancer in a rural population of Central India.

Materials and Methods

Study setting

This study was conducted in Wardha district, located in the northeastern part of the state of Maharashtra in Central India. According to the 2011 census, the population of Wardha district was 1,300,774 of which 48.6% was female. The population was predominantly rural (67.5%). For administrative purposes, Wardha district is divided into eight development blocks: Wardha, Seloo, Deoli, Hinganghat, Samudrapur, Arvi, Karanja, and Ashti. There are 1361 villages and six municipal towns in the district (Website of the Collectorate of Wardha, 2014). Government health care is provided by primary health centres at the village level and rural hospitals at the block level. A district referral hospital and two medical colleges also provide services to the people. In addition, private practitioners of allopathy, ayurveda, and homeopathy also provide health services.

The Department of Pathology at the Mahatma Gandhi Institute of Medical Sciences (MGIMS), Sevagram, has maintained a population based cancer registry since 2010. Cancer cases in residents of Wardha district are registered by active case findings from different hospitals and pathology laboratories in the district, as well as from the adjacent districts. In addition, mortality data is collected from death registers of local government offices and hospitals.

Study design

This study was designed as a cross-sectional survey. The community-based survey was conducted amongst women aged 13-50 years old in urban and rural Wardha district in 2013.

Sample size calculations

Sample size calculations were performed by taking into consideration a 5% error of margin, 95% confidence intervals, and an estimated 50% women with poor knowledge on breast cancer screening. The estimated sample size obtained was 384 women. A design effect of 2.5 was used to take into account the cluster design (n=960). Finally, a total sample of 1000 females (61% from rural areas) was included in the study.

Sampling

Stratified cluster sampling was used to select a representative sample for the survey. An attempt was made to include 125 to 127 women from each development block of the district (Figure 1).

As seen in Figure 1, 391 women were interviewed from the five urban towns of Wardha, Arvi, Deoli, Pulgaon and Hinganghat. In each town, every fifth ward was chosen.

Eligible female respondents were selected from the first and last house in each lane of the selected ward.

In rural areas, 609 women were selected from the rural development blocks of Seloo, Samudrapur, Asthi, and Karanja, and from the rural pockets of the predominantly urban development blocks of Wardha, Arvi, Hinganghat, Deoli, and Pulgaon. Here, five villages were randomly selected in each development block. Eligible respondents from the first and last house of every row of houses were included from every selected village. At each level the size of the urban and rural population of the individual blocks was taken into consideration. In case eligible women refused to participate, or if there were no women in the selected house, the next house in the lane or row was included. In each selected house only one eligible woman was included in survey.

Survey instrument

The authors prepared a questionnaire based on surveys published in the literature (Ferro et al., 1992; Odusanya & Tayo, 2001). The questionnaire was divided into six sections and contained a total of 49 items. The first part elicited demographic and socio-economic information including age, occupation, education, marital status, and family income. The remaining part of the questionnaire dealt with participants' knowledge about breast cancer, its symptoms, and risk factors as well as methods of screening, diagnosis, and treatment. Respondents' self-reported practices of breast cancer screening were also recorded in the questionnaire. Respondents were also asked if they would like to receive more information on breast cancer and in which format. The final part of the questionnaire explored respondents' attitudes towards breast cancer using a five-point Likert scale (Likert, 1932) with 11 items, with a mix of positive and negative statements.

Two native speakers who were fluent in English translated the questionnaire to local languages, i.e. Marathi and Hindi. Backward translation into English was done to check for any discrepancies in the translation. The questionnaires were piloted on 20 female relatives of patients after obtaining informed consent from them. The patients were visiting the Department of Pathology at MGIMS for investigations of diseases other than cancer. The relatives were from the same geographical areas in which the study was carried out. Some questions were modified and worded differently in the final version. Trained social workers who were responsible for conducting the interviews in respondents' homes were briefed about the aims of the survey. A few more changes were made to the questionnaire after discussion with them.

Data collection

Every morning, two social workers visited the selected villages and towns, and together, they interviewed the study participants. The selected female respondents were informed in detail about the study and informed consent was obtained. In case participants were below the age of 18, informed consent was obtained from the legal guardian who was available at home at that time.

Data analysis

Data from all the questionnaires were coded, entered, and cleaned using EPI Info 6.04 software (EPI Info 6). They were then analysed using Stata 13.1 (Statacorp LP, Texas). For descriptive data, frequencies and proportions were calculated and comparisons were made for each variable between the rural and urban groups of women.

Three dependent variables were developed by scoring the responses of participants based on the second and fourth part of the questionnaire as follows:

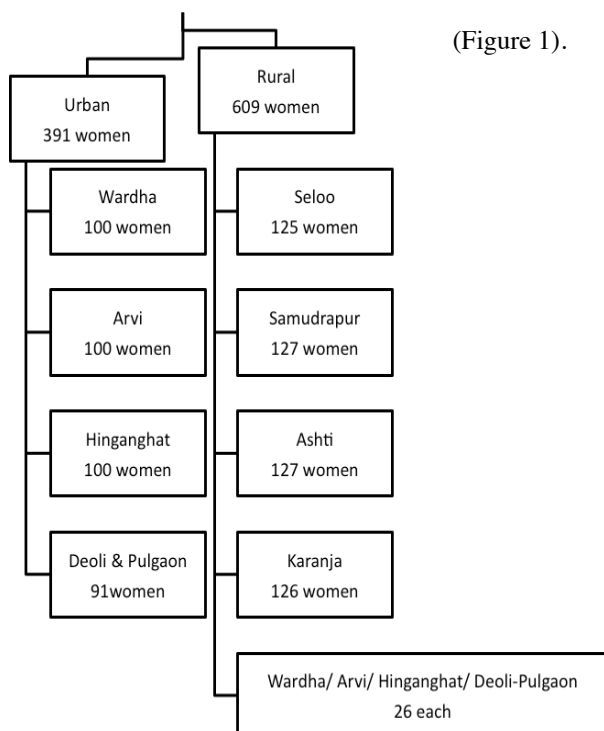Knowledge of breast cancer symptoms and risk

(Figure 1).

Table 1. Knowledge, Attitude and Practices about Breast Cancer in Women in Wardha District

Parameter	Rural women Number (%)	Urban women Number (%)	Test (p -value)*
Awareness about breast cancer			
	384 (63.0)	268 (68.5)	3.16 (0.08)
Awareness about breast self-examination			
	32 (5.3)	27 (6.9)	2.37 (0.50)
Knowledge of breast cancer symptoms and risk factors			
Score 0	233 (38.2)	132 (33.7)	2.09 (0.35)
Score 1 to 3	264 (43.3)	183 (46.8)	
Score 4 to 7	112 (18.3)	76 (19.4)	
Mean	1.73	1.93	-1.65(0.09)
Knowledge about breast cancer diagnosis and treatment			
Score 0	2 (0.3)	1 (0.2)	1.36 (0.50)
Score 1 to 3	309 (50.7)	184 (47.0)	
Score 4 to 7	298 (48.9)	206 (52.6)	
Mean	3.43	3.6	-1.71(0.08)
Attitude towards breast cancer, treatment and screening			
Score -22 to -1	27 (4.4)	15 (3.8)	0.21(0.89)
Score 0	11 (1.8)	7 (1.7)	
Score +1 to +22	571 (93.7)	369 (94.3)	
Mean	6.2	6.76	-2.63(0.01)

*Chi square for proportions and t-test for means

factors: It included seven questions. A score of 1 when a respondent answered 'yes' to any question. Answers of 'no' or 'don't know' were given a score of zero. This variable had a maximum possible score of 7 and a minimum of 0.

Knowledge of breast cancer diagnosis and treatment: There were in total seven questions. A score of 1 when a respondent answered 'yes' to any question. Answers of 'no' or 'don't know' were given a score of zero. This variable had a maximum possible score of 7 and a minimum of 0.

Attitudes and practices about breast cancer: There were 11 questions that covered attitudes of participants towards breast cancer and practices in relation to breast cancer awareness and screening. Responses to the five-point Likert items [11] were scored as follows: Positive attitude, i.e. strongly agree (+2); agree (+1); Neutral, i.e. neither agree nor disagree (0); negative attitude, i.e. disagree (-1); strongly disagree (-2). This variable had a

maximum possible score of 22 and a minimum of -22. The positive scores indicated positive attitudes, while the opposite the negative scores.

Internal consistency was estimated at Cronbach alpha ≥ 0.70 for all three dependent variables. The questions, 'Have you heard about breast cancer,' and 'Have you heard about breast self-examination' were analysed separately as awareness about breast cancer and breast self-examination. Chi-square test for proportions and t-test for means were applied to assess rural/urban differences in knowledge, attitude, and practices. Bivariate analysis was conducted to analyse the relationship between significant socio-demographic factors and the outcome variables. All factors were included in the multivariable linear regression analysis.

Ethics approval for this study was received from the Institutional Ethics Committee of the Mahatma Gandhi Institute of Medical Sciences, Sevagram, Wardha.

Table 2. Bivariate Linear Regression analysis between Socio-demographic Factors and Outcome Variables, Wardha District (regression coefficients with 95% Confidence Intervals in Parenthesis)

	Knowledge about breast cancer symptoms and risk factors	Knowledge about breast cancer diagnosis and treatment	Attitudes and practices about breast cancer
Residence Urban	0.19 (-0.03 - 0.43)	0.16 (-0.02 - 0.34)	0.56 (0.14 -0.98)
Age (in years)			
13-18	Ref	Ref	Ref
19-29	0.41 (0.00 - 0.81)	0.47 (0.15 - 0.78)	0.30 (-0.41 -1.02)
30-39	0.50 (0.09 - 0.92)	0.50 (0.18 - 0.83)	0.11 (-0.62 -0.85)
40-49	0.14 (-0.32 - 0.61)	0.12 (-0.24 - 0.49)	-0.61 (-1.45 -0.22)
Religion			
Hindu	Ref	Ref	Ref
Muslim	-0.40 (-0.95 - 0.14)	-0.13 (-0.56 - 0.28)	-0.02 (-1.00 -0.95)
Buddhist	0.11 (-0.19 - 0.43)	0.19 (-0.04 - 0.44)	0.15 (-0.40 -0.71)
Others	1.38 (-0.24 - 3.02)	1.74 (0.46 -3.02)	2.00 (-0.91 -4.93)
Occupation			
Manual worker/farmer	Ref	Ref	Ref
Office worker / Business	2.24 (1.62 - 2.85)	1.37 (0.89 -1.86)	3.39 (2.29 -4.50)
Housewife	0.52 (0.20 - 0.85)	0.39 (0.13 -0.65)	0.58 (0.00 -1.16)
Retired and others	0.62 (0.24 - 1.01)	0.53 (0.23 -0.84)	1.44 (0.75 -2.13)
Unemployed / Student	0.83 (-0.03 - 1.70)	0.49 (-0.19 -1.17)	1.42 (-0.12 -2.98)
Education			
Illiterate/no formal education	Ref	Ref	Ref
Primary school	0.84 (0.20 - 1.48)	0.70 (0.20 -1.20)	0.45 (-0.70 -1.60)
Middle school	1.07 (0.52 - 1.63)	0.82 (0.38 -1.25)	1.29 (0.28 -2.29)
College	2.04 (1.48 - 2.60)	1.62 (1.18 -2.05)	2.66 (1.64 -3.67)
Marital Status			
Never married	Ref	Ref	Ref
Married	0.03 (-0.22 - 0.30)	-0.06 (-0.27 -0.14)	-0.93 (-1.40 - -0.46)
Widowed / divorced	0.15 (-0.79 - 1.09)	-0.29 (-1.03 -0.44)	-0.17 (-1.84 -1.49)
Income (in rupees)			
< 5000 per month	Ref	Ref	Ref
5,000-10,000 per month	1.11 (0.72 -1.50)	1.10 (0.80 -1.40)	1.39 (0.68 -2.09)
>10,000 per month	1.23 (0.26 -2.20)	0.25 (-0.49 -0.01)	1.15 (-0.59 -2.89)
Age at first marriage (in years)			
15 to 19	Ref	Ref	Ref
20 to 24	0.15 (-0.12 - 0.43)	0.16 (-0.04 -0.38)	0.46 (0.02 -0.96)
25 to 33	1.26 (0.75 - 1.76)	1.04 (0.65 -1.44)	2.00 (1.10 -2.89)
Age at first pregnancy (in years)			
15 to 19	Ref	Ref	Ref
20 to 24	0.04 (-0.29- 0.39)	0.01 (-0.25 -0.28)	0.38 (-0.23-0.99)
25 to 33	0.67 (0.21-1.13)	0.48 (-0.11-0.84)	1.50 (0.68-2.32)
Not applicable	0.09 (-0.26- 0.45)	0.14 (-0.13-0.43)	1.34 (0.70 -1.98)

Results

Socio-demographic characteristics

A total of 609 rural and 391 urban women responded to the questionnaire. Most participants (43.6%) belonged to the age group of 19-29 years. The mean age of the respondents in the rural group was 28.6 years, while it was 29.5 years in the urban group. Most respondents were Hindus (78.5%), while Buddhists (16.3%) constituted the next common group. Housewives constituted more than half (52.6%) of the respondents. Almost 73% of the respondents were married women. Nearly half of the rural respondents had at least finished high school (62.9%), and 44.7% of urban respondents had received a college education. Most respondents (89.2%) reported their income as less than 5000 rupees (Rs.) per month. Only 1% of rural women and 2% of urban women reported their income as more than Rs. 50,000 per month.

Almost 40% of rural women were married before the age of 19 years, while around 33% of urban women were married between the ages of 20 and 24 years. Around 14% of both urban and rural respondents had their first pregnancy before the age of 19. Most of the respondents (63.3%) had had two or more pregnancies.

Knowledge, attitudes, and practices about breast cancer

Table 1 presents the knowledge, attitudes, and practices of women in Wardha district towards breast cancer by place of residence. Similar proportions of rural (63%) and urban (68.5%) had heard about breast cancer. However, only less than 7% women in rural and urban areas of Wardha district had heard about breast self-examination.

Knowledge about breast cancer, its symptoms, risk factors, diagnostic modalities, and treatment was not significantly different in rural and urban women. Both

Table 3. Multivariate Linear Regression Analysis between Socio-demographic Factors and Outcome Variables, Wardha District (Regression Coefficients with 95% Confidence Intervals in Parenthesis)

	Knowledge about breast cancer symptoms and risk factors	Knowledge about breast cancer diagnosis and treatment	Attitudes and practices about breast cancer
Residence (urban)	-0.01 (-0.24 -0.21)	-0.01 (-0.19 -0.16)	0.33 (-0.08 -0.75)
Age (in years)			
13-18	Ref	Ref	Ref
19-29	0.40 (-0.03 -0.84)	0.64 (0.29 -0.98)	-1.04 (-0.23 -1.86)
30-39	0.53 (0.01 -1.06)	0.80 (0.39 -1.2)	-1.35 (-0.48 -2.39)
40-49	0.49 (-0.09 -1.08)	0.67 (0.21 -1.11)	-1.01 (-0.02 -2.15)
Religion			
Hindu	Ref	Ref	Ref
Muslim	-0.19 (-0.71 -0.32)	-0.02 (-0.38 -0.42)	-0.18 (-0.78 -1.12)
Buddhist	-0.02 (-0.32 -0.26)	-0.11 (-0.12 -0.34)	-0.05 (-0.58 -0.49)
Others	1.54 (-0.00 -3.09)	-1.87 (-0.66 -3.08)	-2.54 (-0.17 -5.48)
Occupation			
Manual worker/farmer	Ref	Ref	Ref
Office worker / Business	1.53 (0.90 -2.17)	0.65 (0.16 – 1.14)	1.99 (0.83 -3.14)
Housewife	0.18 (-0.14 -0.51)	0.97 (-0.15 -0.35)	-0.05 (-0.64 -0.53)
Retired and others	0.68 (0.21 -1.14)	0.51 (0.15 -0.87)	0.56 (-0.26 -1.40)
Unemployed / Student	0.47 (-0.36 -1.31)	0.24 (-0.40 -0.90)	0.85 (-0.67 -2.38)
Education			
Illiterate/no formal education	Ref	Ref	Ref
Primary school	0.71 (0.08 -1.34)	0.65 (0.16 -1.4)	0.41 (-0.73 -1.56)
Middle school	1.16 (0.59 -1.73)	0.85 (0.40 -1.3)	1.31 (0.30 -2.33)
College	1.99 (1.39 -2.59)	1.48 (1.02 -1.9)	2.25 (1.20 -3.31)
Marital Status			
Never married	Ref	Ref	Ref
Married	-1.03 (-2.09 -0.02)	-0.41 (-1.10 -0.56)	-0.72 (-2.65 -1.21)
Widowed / divorced	-0.93 (-2.28 -0.42)	-0.60 (-1.51 -0.59)	-0.30 (-2.50 -2.44)
Income (in rupees)			
< 5000 per month	Ref	Ref	Ref
5,000-10,000 per month	0.49 (0.09 -0.89)	0.65 (0.34 -.0. 96)	0.56 (-0.16 -1.28)
>10,000 per month	0.48 (-0.45 -1.41)	-0.29 (-1.02 -0.43)	0.01 (-1.68 -1.72)
Age at first marriage (in years)			
15 to 19	Ref	Ref	Ref
20 to 24	-0.12 (-0.43 -0.17)	-0.07 (-0.28 -0.13)	0.13 (-0.47 -0.50)
25 to 33	0.23 (-0.39 -0.86)	0.33 (-0.06 -0.72)	0.73 (-0.19 -1.66)
Not applicable	-1.34 (-2.47 - -0.22)	-0.10 (-0.42 -0.22)	-0.49 (-2.44 -1.46)
Age at first pregnancy (in years)			
15 to 19	Ref	Ref	Ref
20 to 24	-0.20 (-0.57 -0.17)	-0.20 (-0.54 -0.03)	-0.03 (-0.71 -0.64)
25 to 40	-0.06 (-0.61 -0.48)	-0.18 (-0.67 -0.19)	-0.57 (-0.48 -1.5)
Not applicable	-0.34 (-0.92 -0.22)	-0.32 (-0.88 -0.00)	-0.23 (-0.96 -1.10)

groups displayed very low mean scores, 1.73 and 1.93 respectively, out of a maximum possible of 7, on questions related to knowledge about symptoms and risk factors of breast cancer. Mean scores on questions related to knowledge about diagnosis and treatment of breast cancer were slightly better (3.43 vs. 3.6), but with no differences between urban and rural women. The highest possible score of 7 on questions related to symptoms and risk factors was scored by only 2.1% of the respondents.

However, attitudes of urban and rural women towards breast cancer treatment and screening were significantly different, with urban women demonstrating more positive attitudes (6.7 vs. 6.2, p<0.05). Only 0.5% respondents obtained a complete score of 7 on questions related to diagnosis and treatment of breast cancer.

Only 4.5 % of women ever practiced breast self examination out of which 3.45% were from rural areas and 6.14% were from urban areas, the difference being statistically significant. No women in the study group had heard about mammography.

Regression analysis

Table 2 shows the results of bivariate regression analysis between socio-demographic factors and outcome variables. Knowledge of breast cancer symptoms, risk factors, diagnosis, and treatment correlated significantly with increasing age of respondents, except in the age group of 40-49 years. There was a significant correlation between employment and awareness about breast cancer, with all groups (except unemployed/students) knowing more than manual workers/farmers. With increasing education, women showed higher knowledge about breast cancer. Women who were first married at 25-33 years of age and who had their first pregnancy between 25-40 years of age also had significantly higher knowledge about breast cancer. While women showed higher knowledge of symptoms and risk factors of breast cancer with increasing income, only women in the middle-income group demonstrated significant knowledge of diagnosis and treatment of breast cancer. Place of residence, religion, and marital status were not associated with knowledge of breast cancer.

As seen in Table 2, women who lived in urban areas, who were educated, were housewives, or were employed, retired from service, or married showed a positive attitude towards breast cancer screening practices. Women who belonged to the middle-income group also showed positive attitudes towards breast cancer. With increasing age at marriage and age at first pregnancy, attitudes towards breast cancer were found to be more positive. However, no association was found between positive attitudes about breast cancer screening in students and unemployed women and women in the age group between 40 and 49 years. Attitudes towards breast cancer screening did not seem to be influenced by religion.

In the multivariate linear regression analysis (Table 3), knowledge about breast cancer symptoms, risk factors, diagnosis, and treatment correlated significantly with education and employment (professional workers and retired women). Women between the ages of 30 and 39 years, as well as those belonging to the middle-income

group (Rs. 5000-10,000 per month) also showed a positive association with knowledge about symptoms and risk factors of breast cancer. Knowledge about diagnosis and treatment of breast cancer correlated significantly with increasing age of women.

Attitudes towards breast cancer screening practices

Most urban (95.4%) and rural (96.4%) women were ready to visit a doctor as soon as they felt a mass in their breasts. They were willing to perform breast self examination at home if taught, and were ready to participate in breast cancer screening programmes in the

Discussion

Our survey showed that about one-third of respondents from rural and urban areas in Wardha district had not heard of breast cancer. This important level of ignorance can further be seen from the low scores on knowledge about symptoms and risk factors of breast cancer. Though several other studies from India (Yadav & Jaroli, 2010; Doshi et al., 2012; Ramalingam et al., 2012; Sharma et al., 2013) and other developing countries (Odusanya & Tayo, 2001; Akel et al., 2011; Nafissi et al., 2012; Aydogan et al 2015; Noreen et al 2015) have shown large numbers of women lacking knowledge about symptoms and risk factors associated with breast cancer, it is a great concern from a preventive point of view.

Rural and urban women did not differ significantly in their knowledge of breast cancer in this study. However, awareness about breast cancer varied depending upon education, employment, and economic status. Sharma et al also found that women with higher levels of education had significantly higher knowledge about breast cancer in their study of 300 women in Andhra Pradesh in India (Sharma et al., 2013). Women from low socio-economic strata experience higher mortality rates due to diagnosis at late stages (Das & Pathak, 2012). From our study, it appears that formal schooling is a major determinant of level of knowledge about breast cancer. It has been also observed that after awareness programmes there was significant increase in level of knowledge about breast cancer amongst college teachers in different states in India at 6 months and this was sustained at 1 year (Shankar et al., 2015). Therefore, steps need to be taken to expand awareness about symptoms of the disease through health education campaigns through women-friendly organisations. In addition, awareness about breast self-examination in our study was extremely low with only four out of 1000 women practicing breast self-examination. Similar results have been observed in a survey of 300 women from Andhra Pradesh in South India, where only 4.6% of the women were aware of the practice of breast self-examination (Uche, 1999). Breast self-examination is inexpensive and can be performed by women on themselves. The rationale behind the practice of self-examination as a screening test is that when patients suspect breast cancer, they are most likely to report it early to health providers. Breast self-examination has been shown to have a positive association with early detection of breast cancer (Uche, 1999). Studies have shown that

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most early breast cancers are self-discovered by women who performed breast self-examination on a regular basis (Odusanya, 2001). Health beliefs concerning the perceived susceptibility of breast cancer and the perceived benefits of screening significantly impact the screening practices (Shiryazdi et al., 2014). Women need to be 'breast-aware' to facilitate their involvement in screening.

Most patients in India usually seek medical advice when the disease is in a fairly advanced stage. Prolonged delay in initiating treatment of breast cancer has been shown to be associated with increased tumour size, advanced stage of disease, and poor long-term survival Okobia et al., 2006). Over 70% of Indian women are diagnosed at advanced stages when little or no benefit can be derived from any form of therapy (Dinshaw et al, 1999). In order to develop effective strategies for early detection of breast cancer, we need to understand the key determinants of early health seeking behaviour. Education and associated factors like socio-economic status and employment have an impact on early detection of the disease and initiation of treatment in early stages of cancer.

Both women from rural and urban areas demonstrated positive attitudes towards breast cancer screening practices and treatment. More than 93% women were keen to participate in future breast cancer screening programmes. This is important to know, because if properly trained, most women would participate in cancer screening activities, which would ultimately result in detecting early stage cases and lowering the disease burden.

The strength of this study lies in its design, where large numbers of both rural and urban women were surveyed in the same district. This study has some limitations as well. Given the social and cultural circumstances, some women in our study might have hesitated to speak openly about breast cancer to a stranger. Other factors such as response bias might have influenced our results (Lavrakas, 2008). We tried to minimise this bias through a careful training of female local data collectors. A well designed qualitative study could provide better insight on how health personnel can enhance awareness and improve participation of women in screening programmes.

In conclusion, our survey showed poor awareness and knowledge about breast cancer, its symptoms and risk factors in rural women in Central India. Breast self-examination is hardly practiced, though the willingness to learn is high. The dramatic rise in the prevalence of breast cancer in the recent years should have prompted the government to initiate specific measures to increase awareness and educate women to seek early medical advice when they experience breast symptoms. Given that most women display positive attitudes towards breast cancer screening, there is an opportunity to promote self-examination by health care professionals. This simple, inexpensive technique would be more acceptable to diagnose patients early, rather than the expensive and resource-intensive mammography procedures recommended in high-income countries. Development of revised policy guidelines to disseminate awareness of breast cancer is imperative to control the rising incidence of the disease among women in India.

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