Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/cegh

Original Article

Acceptance of cervical and breast cancer screening and cancer awareness among women in Villupuram, Tamil Nadu, India: A cross sectional survey

M. Senthil Kumar^a, P. Chandrasekar Shanmugapriya^b, Prabhdeep Kaur^{c,*}^a Deputy Director Health Services, Directorate of Public Health and Preventive Medicine, Government of Tamil Nadu, India^b Technical Assistant (Project), National Institute of Epidemiology, ICMR, Chennai, India^c Scientist D, National Institute of Epidemiology, ICMR, Chennai, India

ARTICLE INFO

Article history:

Received 15 September 2015

Accepted 28 October 2015

Available online 21 November 2015

Keywords:

Cancer cervix

Cancer breast

Screening

India

ABSTRACT

Background and objectives: Cancer cervix and breast are the leading cancers of women in rural and urban India respectively. An opportunistic screening program for cancer cervix and cancer breast was initiated in Tamil Nadu, India since 2011. We estimated the acceptance of screening for cervical and breast cancer and cancer awareness among women attending primary health care facilities in Villupuram district, Tamil Nadu, India.

Methods: We did a cross sectional study among women aged ≥ 30 years attending PHCs in Villupuram during 2013. Sample size for the cluster design was 240 women with PHC as cluster. We collected data regarding acceptance of screening and awareness regarding cancer cervix and breast risk factors, screening and treatment using semi structured questionnaire. We computed the proportions for the acceptance and awareness related variables.

Results: We surveyed 240 women with mean age of 44 years. Only 70 (29%) and 83 (35%) women agreed to undergo cancer cervix and cancer breast screening respectively. Overall, 167 (70%) had ever heard of cancer. The proportion of women who were aware of cancer cervix and cancer breast screening were 20% and 18% respectively. Women unaware of any risk factors of cancer cervix and breast were 81% and 85% respectively.

Conclusion: We observed low acceptance of cancer screening and poor awareness regarding risk factors and treatment. There is need for awareness programs involving mass media and community health workers and increased emphasis on counseling prior to the screening to allay the fears and to address the misperceptions.

© 2015 INDIACLEN. Published by Elsevier, a division of Reed Elsevier India, Pvt. Ltd. All rights reserved.

* Corresponding author. Tel.: +91 4426136233.

E-mail address: kprabhdeep@gmail.com (P. Kaur).<http://dx.doi.org/10.1016/j.cegh.2015.10.007>

2213-3984/© 2015 INDIACLEN. Published by Elsevier, a division of Reed Elsevier India, Pvt. Ltd. All rights reserved.

1. Introduction

Globally, an estimated 12.7 million new cancer cases and 7.6 million deaths (13% of all deaths) occurred in 2008. Breast cancer was by far the most common cancer diagnosed, followed by cervical cancer among women worldwide.¹ Cervical and breast cancer account for 40–50% of total cancer burden affecting women in India. An estimated cervical cancer incidence was 27/100,000 population (134,420 cases) and mortality was 15.2/100,000 population (72,825 deaths) in 2008. An estimated breast cancer incidence was 22.9/100,000 population (115,251 cases) and mortality was 11.1/100,000 (53,592 deaths). Cervical and breast cancers incidence were 21.2/100,000 population and 26.07/100,000 population in Chennai city based on the only population based cancer registry in Tamil Nadu.²

Coverage in various developing countries ranges from 1.1% to 57.6% for cervical cancer screening and for breast cancer screening it ranges from 0% to 26%.³ In 2006, coverage for cervical cancer screening among Indian women was 2.6% (4.9% among urban and 2.3% among rural).⁴ A study from rural Tamil Nadu reported 63.4% participation in the cancer cervix screening.⁵ Cancer screening programs in developing countries identified various challenges such as low participation and poor follow-up among the participants.^{6–8} Screening is an intervention required for rural populations to reduce high cancer mortality to incidence ratio that is due to mix of late presentation, poor socioeconomic status, and restricted access to cancer services.⁹

National Cancer Control Program was launched in 1975 and integrated with National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) in 2010–11 which is being implemented as a pilot in 100 districts of India.¹⁰ During 2011, Tamil Nadu Health Systems Project (TNHSP), an initiative of Government of Tamil Nadu launched NCD intervention program with support from World Bank in all the districts in phased manner. One of the program components was opportunistic screening for cancer cervix and cancer breast for women aged 30 years and above. A trained staff nurse posted under the program conducts NCD screening in the special clinic named as Non-Communicable Disease (NCD) clinic in all the public sector primary and secondary care facilities. Nurse sequentially conducts screening for both cancers in a separate room in privacy. The screening for both cancers takes 15–20 min. Screening of cancer cervix is done using Visual Inspection with Acetic acid (VIA) and Visual Inspection with Lugol's Iodine (VILI) methods, and positive women are referred to secondary care institutions for further evaluation. Screening for breast cancer is done using clinical breast examination (CBE), and positive patients are referred for further investigations.¹¹

Anecdotal observations by the implementing staff indicated low participation in the screening among the eligible women. However there was lack of objective data regarding proportion of women attending Primary Health centers (PHC) who were willing to undergo the cervical/breast cancer screening and reasons for lack of willingness. Our primary objective was to estimate the proportion of women ≥ 30 years, who accepted cervical and breast cancer screening and

reasons for lack of acceptance in the primary care facilities in Villupuram district, Tamil Nadu. We also estimated the awareness regarding symptoms, risk factors, screening and treatment options for cancer cervix and breast.

2. Methods

2.1. Study design and population

We did a cross sectional study in Villupuram District Tamil Nadu during January–March 2013. Villupuram district is located in the northern part of Tamil Nadu state, India. It has the total population of 3.4 million, and 85% live in rural areas. The overall female literacy rate is 64%; lower in rural areas (61%) as compared to urban areas (79%).¹² We included the women aged 30 years and above visiting the PHC on the day of survey for any condition/ailment. A nurse posted in the PHC exclusively for screening program assessed the woman for eligibility for screening using the program protocol. The program protocol has exclusion criteria namely pregnancy, menstruating on the day of visit, history of delivery or abortion within 12 weeks and previous history of treatment of cancer cervix.¹¹ Women eligible for screening were included in our study.

2.2. Sample size and sampling strategy

We calculated the sample size using assumptions; estimated proportion of willing women 50%, confidence interval of 95%, absolute precision: $\pm 10\%$ and design effect 2.5. Sample size was 240 with 16 clusters and cluster size of 15. We selected 16 PHC using population proportional to size linear systematic sampling from 92 PHC in the district. PHC were distributed across all blocks of the district. We selected 15 consecutive women visiting PHC on the day of study who were above 30 years and willing to participate in the study.

2.3. Operational definitions

Cancer screening: Examination of the asymptomatic women visiting PHC using VIA/VILI for cervical cancer and clinical breast examination for cancer breast.

Acceptance of screening: Women aged ≥ 30 years, who agreed to undergo the cancer cervix/cancer breast/or both screening tests in the opportunistic screening program at the PHC.

2.4. Data collection

We used semi-structured, interviewer-administered questionnaire in regional language, Tamil, to collect the data regarding socio-demographic and patient characteristics, awareness regarding cancer cervix and cancer breast symptoms and screening, social perception of cancer, willingness for the screening and the reasons for lack of willingness. We inquired, whether they could list any of the risk factors for cancer cervix or cancer breast spontaneously, and subsequently we read out a list of risk factors and probed their knowledge regarding those risk factors. We also followed up the women, who agreed to undergo screening the same day to document the screening

Table 1 – Key characteristics of the participants and symptoms at presentation, Villupuram, Tamil Nadu, 2013 (N = 240).

		All women N = 240		Screened women N = 66	
		n	%	n	%
Characteristics					
Age	≥44 years	129	54	32	49
Marital status	Married	191	80	53	80
Education	Illiterate	140	58	32	49
Religion	Hindu	225	94	61	92
Caste	SC & ST	71	30	16	24
Occupation	Skilled laborer	151	63	2	7
Reason to visit OPD	Acute illness	184	77	49	74
Gynecological/breast symptoms					
Lower abdominal pain		60	25	30	46
White discharge		38	16	21	32
Breast pain		18	8	6	9

experience and reasons if they could not undergo screening despite willingness for the same. We did ten in-depth interviews prior to the main study to identify the key issues/themes for inclusion in the semi-structured questionnaire. We trained female nursing graduates for data collection, and the supervision was done by the principal investigator.

2.5. Data analysis

The data from semi-structured questionnaire were entered and analyzed using Epi-info version 3.5.2. We computed the proportions for awareness, willingness for the screening, reasons for lack of willingness, perceptions regarding cancer, awareness regarding various risk factors and screening program. We computed unadjusted and adjusted odds ratio (OR) with 95% confidence intervals for factors associated with lack of acceptance of screening using logistic regression method.

2.6. Human subject protection

We obtained written informed consent from the respondents. We obtained approval of Institutional Ethics Committee, National Institute of Epidemiology, Chennai. Women were counseled regarding risk factors of cancers and the need for screening to ensure early detection.

3. Results

3.1. Descriptive characteristics of the participants

We contacted 264 women and among them 240 agreed to participate in the study. The main reason for refusal was lack of time to participate in the interview due to other responsibilities. We surveyed 240 women above 30 years. Mean age was 44 years (age range 30–60 years) and mean age at marriage was 19 years. Among them, 191 (79.6%) were currently living with their spouse. Overall, 58% had no school education and 17.5% were high school and above. The most common religion was Hindu (94%). Majority (67%) of them were unskilled laborers and only 10% of them were skilled laborers. Median income was Rs. 1500. Large proportion (76.7%) visited the PHC for acute illness care and one fourth visited the PHC for chronic

condition or accompanied another family member. Women, who reported any family member, friend or relative with history of any cancer, were 15%. The gynecological symptoms reported were lower abdominal pain [60 (25%)], white discharge 38 (15.8%), and dysuria 16 (6.7%). Breast pain was reported by 18 women (7.5%) and breast lump by 3 (1.25%) women (Table 1).

3.2. Acceptance of cervical and breast cancer screening and reasons for lack of acceptance

Only 70 (29%) women were willing for cancer cervix screening and 83 (35%) were willing for cancer breast screening. Overall, 70 respondents (29%) agreed to undergo screening for both the cancers. The most common reasons for lack of acceptance were subjective feeling of wellness and no perceived need to undergo screening, personal work, fear of the screening procedure etc.

3.3. Post screening experience of the women

Among the 52 women who underwent cervical cancer screening, 49 (94%) were comfortable during the procedure, 46 women (89%) mentioned that NCD staff nurse counseled before screening and informed the screening results, 50 considered privacy of the screening area was acceptable. Among the 70 women, who underwent cancer breast screening, 67 (96%) were comfortable during the procedure.

3.4. Reasons for not undergoing screening among the willing women

Among 70 women willing to undergo cancer cervix screening; 18 did not get undergo screening due to either inability to wait due to personal work or unavailability of the power supply required for using magna-vision lamp or both. Among 83 women willing for cancer breast screening, 13 did not undergo screening due to personal work or overcrowding in the PHC leading to long waiting time.

3.5. Awareness regarding cervical and breast cancer

Among 240 women, 167 (70%) had ever heard of cancer, and 84 (35%) believed that cancer was communicable disease. Among

Table 2 – Awareness on cancer, cancer cervix and cancer breast among study population in Villupuram, Tamil Nadu, 2013 (N = 240).

	n	%
General awareness regarding cancer		
Ever heard of cancer	167	70
Cancer is a communicable disease	84	35
Awareness regarding cancer breast screening in PHC	44	18
Awareness regarding cancer breast symptoms		
I don't know	182	76
Pain in the breast	30	13
Discrete hard lump in the breast	24	10
Treatment options for cancer breast		
Medicines	24	10
Surgery	19	8
Awareness regarding cancer cervix screening in PHC	47	20
Awareness regarding cancer cervix symptoms		
I don't know	153	64
Pelvic pain/lower abdominal pain	57	24
Excessive foul smelling vaginal discharge	16	7
Treatment options for cancer cervix		
Medicines	28	12
Surgery	13	5
Radiotherapy	3	1
Social perception regarding cancer cervix (using case vignette)		
Cancer cervix patient might share information with husband	218	91
Negative change in neighborhood/family members behavior toward patient	170	71
Cancer may cause marital conflict	164	68
Having cancer cervix might affect the respect in the society	161	67

167 women who had heard of cancer, leading sources of information were friends and relatives (74%), women from neighborhood who already underwent screening (11%) and television (8%). Respondents who could spontaneously name breast and cervical cancers as examples of common cancers of women were 45% and 18% respectively.

3.6. Awareness regarding screening, symptoms and treatment

The proportion of women, who were aware of cancer cervix and cancer breast screening were, 20% and 18% respectively. There was lack of awareness about cancer cervix and cancer

breast symptoms among 64% and 76% women respectively. Cancer cervix symptoms such as pelvic pain, foul smelling vaginal discharge, and abnormal vaginal bleeding were listed by 24%, 7%, and 5% women respectively. Cancer breast symptoms such as lump in the breast and ulceration over the breast were described by 10% and 3% women, respectively. Overall, proportion of women, who mentioned medicine, surgery, and radiotherapy as treatment options for cancer cervix were 12%, 5%, and 1% respectively. Similarly awareness was low regarding cancer breast treatment (Table 2).

3.7. Social perception regarding cancer

A case vignette was used to understand the social perceptions regarding cervical cancer. We described a woman with two children whose husband was a small shop owner in same village and she was diagnosed with cancer cervix and inquired their perceptions with various questions. Majority (91%) of them felt that the patient might share the cancer diagnosis information first with their husband. Nearly two third felt that cancer will affect respect in the society (Table 2).

3.8. Factors associated with lack of acceptance of screening

Lack of symptoms, lack of awareness regarding screening and treatment in PHC and lack of history of cancer among family members/friends were associated with lack of acceptance of screening (Table 3).

3.9. Awareness regarding risk factors for cancer cervix and cancer breast

The respondents who were not aware of any risk factors of cancer cervix and cancer breast were 81% and 85% respectively. Very few respondents spontaneously reported tobacco products and multiple illegal contacts as risk factors for cervical cancer. After probing, 68% women attributed cancer cervix cause to tobacco products and 47% to illegal contact of either spouse.

Breastfeeding related issues were reported as risk factor for breast cancer by 6% women spontaneously. After probing, 54% women attributed cancer breast to breast feeding related issues and 30% mentioned illegal contacts as risk factor (Figs. 1 and 2).

Table 3 – Factors associated with lack of acceptance of cancer cervix/cancer breast screening among study population in Villupuram district, Tamil Nadu, 2013 (N = 240).

Exposure	Not willing for screening		Willing for screening		Odds ratio (OR)	95% CI		AOR ^a	95% CI	
	n	%	n	%		LL	UL		LL	UL
No history of white discharge/abdominal pain & dysuria	127	75	43	25	3.9	2.2	7.1	4.0	2.2	8.0
Unaware of cancer cervix/breast treatment & screening in PHC	131	70	55	30	2.6	1.4	4.8	2.5	1.3	4.8
Lack of history of cancer among family members/friends	140	69	64	31	2.4	1.2	5.0	2.4	1.1	5.2

^a All factors adjusted in a model.

Fig. 1 – Awareness regarding cancer cervix risk factors among women, Villupuram, Tamil Nadu, 2013 (N = 240).

4. Discussion

One third of the women accepted the screening for cervical and breast cancer in rural primary care setting in Tamil Nadu. Majority of the women were not aware of the symptoms and treatment for both the cancers. Women had heard the name of the cancer disease but they did not understand the risk factors related to cervical and breast cancer. The results were in contrast to a study conducted in Mumbai urban slum, in which awareness was high probably due to various ongoing interventions in the study population.¹³ Lack of awareness was a major predictor for lack of willingness of cancer screening as per the studies conducted in various developing countries.^{14,15} Poor awareness of symptoms and consequences might lead to delayed health seeking and higher mortality in the absence of proactive interventions to improve early detection.^{10,16–18} Lack of awareness of treatment of cervical and breast cancer might lead to lack of compliance to follow-up diagnostic investigations and further treatment, which is a major hurdle for the success of the screening programs.¹⁹ The messages in the awareness programs need to be specifically designed to enhance the understanding regarding risk factors, benefits of early detection, and the available treatment options.

Fig. 2 – Awareness regarding cancer breast risk factors among women, Villupuram, Tamil Nadu, 2013 (N = 240).

Friends and relatives were the main source of information in our study and similar observations were made in the screening program in the Mumbai slums.¹³ Health workers and mass media played limited role in enhancing awareness among women. A systematic review identified invitations, health education, counseling, and home visits by health workers, as interventions to improve the screening uptake by the community.²⁰ Community based screening approaches and active involvement of health workers were two approaches that enhanced screening uptake in screening programs developing countries in Mumbai, India and Brazil.^{21,22} Positive screening experience of women in our study suggested that proper counseling and appropriate clinical environment that ensure that privacy can make the screening acceptable in context of rural poorly educated women. They are likely to motivate other women to participate in the screening in addition to awareness from other media. Peer led interventions by women who underwent screening, active involvement of health workers and use of mass media in addition to health facility based counseling might be potentially useful interventions to improve the screening uptake in Tamil Nadu.

Most of the women felt that cancer status had to be kept confidential as it might affect their societal status. Even though they were willing to share the information with the husband, they perceived cancer may cause marital conflict. This suggested negative perceptions of cancer in the community. A study conducted in Mumbai documented the psychosocial issues such as anxiety, poverty, abandonment by husbands and the absence of social security which are related to cancer stigma.²³ A qualitative study conducted in Egypt showed effectiveness of culture-specific community health education program to address the concerns of women and improve the screening.²⁴ Another strategy noted in a study from Saudi Arabia was involvement of male members of the family to encourage participation of women in the screening.²⁵ It is crucial to acknowledge the negative perceptions and address them through culturally appropriate health education at community level while implementing screening programs in the rural settings.

We conducted the survey among women visiting the primary care facilities, and therefore the observations cannot be extrapolated to all women in the community.

We observed low acceptance of cancer screening among women attending primary care public sector facilities in Villupuram, Tamil Nadu. Women had poor awareness regarding cancer causes, symptoms and treatment, and negative perception regarding cancer diagnosis. There is need for awareness programs involving mass media and community health workers. Counseling and health education should be given more emphasis prior to the screening in the health facility to allay the fears and to address the misperceptions.

Author contributions

MSK: Design, data collection, literature search, analysis and first draft of manuscript. SPC: Development of data collection tools, analysis, manuscript preparation. PK: Design, literature search, analysis, manuscript preparation.

Conflicts of interest

The authors have none to declare.

Acknowledgments

We thank the Government of Tamil Nadu and Dr Prakash, District Coordinator – Tamil Nadu Health Systems Project, Villupuram district, Tamil Nadu for the support during the conduct of study. We thank all the PHC staff, data collectors and participants of the study for sparing their valuable time for the study. This study was funded by National Institute of Epidemiology, Chennai.

REFERENCES

- Boyle P, Levin B. *World cancer report 2008*. IARC Press, International Agency for Research on Cancer; 2008.
- National Cancer Registry Programme (ICMR) B. *Consolidated Report of Population Based Cancer Registries 2001–2004: Bangalore, India*. 2006.
- Akinyemiju TF. Socio-economic and health access determinants of breast and cervical cancer screening in low-income countries: analysis of the World Health Survey. *PLoS ONE*. 2012;7(11):e48834. <http://dx.doi.org/10.1371/journal.pone.0048834>.
- Gakidou E, Nordhagen S, Obermeyer Z. Coverage of cervical cancer screening in 57 countries: low average levels and large inequalities. *PLoS Med*. 2008;5(6):e132. <http://dx.doi.org/10.1371/journal.pmed.0050132>.
- Sankaranarayanan R, Rajkumar R, Arrossi S, et al. Determinants of participation of women in a cervical cancer visual screening trial in rural south India. *Cancer Detect Prev*. 2003;27(6):457–465.
- Agurto I, Bishop A, Sanchez G, Betancourt Z, Robles S. Perceived barriers and benefits to cervical cancer screening in Latin America. *Prev Med*. 2004;39(1):91–98. <http://dx.doi.org/10.1016/j.ypmed.2004.03.040>.
- Arrossi S, Paolino M, Sankaranarayanan R. Challenges faced by cervical cancer prevention programs in developing countries: a situational analysis of program organization in Argentina. *Rev Panam Salud Publica*. 2010;28(4):249–257.
- Othman NH, Rebolj M. Challenges to cervical screening in a developing country: the case of Malaysia. *Asian Pac J Cancer Prev*. 2009;10(5):747–752.
- Sankaranarayanan R, Swaminathan R. Verbal-autopsy-based projection of cancer deaths in India. *Lancet*. 2012;379(9828):1770–1772.
- Government of India. Report of the Working Group on Disease Burden for 12th Five Year Plan. In: *Directorate General of Health Services MOHFW*. New Delhi: Government of India, Planning Commission; 2011. pp. WG-3.
- TNHSP. *Programme for Prevention and Treatment of Non Communicable Diseases, Manual for Programme Managers*. Chennai, India: Health & Family Welfare Dept, Government of Tamil Nadu; 2011.
- Government of India. Census of India. In: *Operations DOC, ed. In: Provisional Population Totals. Paper 2 Volume 1 of 2011 ed*. Chennai, Tamil Nadu: Register General and Census Commissioner of India; 2011.
- Kumar YS, Mishra G, Gupta S, Shastri S. Level of cancer awareness among women of low socioeconomic status in Mumbai slums. *Asian Pac J Cancer Prev*. 2011;12(5):1295–1298.
- Basu P, Sarkar S, Mukherjee S, et al. Women's perceptions and social barriers determine compliance to cervical screening: results from a population based study in India. *Cancer Detect Prev*. 2006;30(4):369–374. <http://dx.doi.org/10.1016/j.cdp.2006.07.004>.
- Perkins RB, Langrish S, Stern LJ, Simon CJ. A community-based education program about cervical cancer improves knowledge and screening behavior in Honduran women. *Rev Panam Salud Publica*. 2007;22(3):187–193.
- Sim HL, Seah M, Tan SM. Breast cancer knowledge and screening practices: a survey of 1,000 Asian women. *Singapore Med J*. 2009;50(2):132–138.
- Nene B, Jayant K, Arrossi S, et al. Determinants of womens participation in cervical cancer screening trial, Maharashtra, India. *Bull World Health Organ*. 2007;85(4):264–272.
- Choconta-Piraquive LA, Alvis-Guzman N, De la Hoz-Restrepo F. How protective is cervical cancer screening against cervical cancer mortality in developing countries? The Colombian case. *BMC Health Serv Res*. 2010;10:270. <http://dx.doi.org/10.1186/1472-6963-10-270>.
- Sankaranarayanan R, Mathew B, Jacob BJ, et al. Early findings from a community-based, cluster-randomized, controlled oral cancer screening trial in Kerala, India. The Trivandrum Oral Cancer Screening Study Group. *Cancer*. 2000;88(3):664–673.
- Everett T, Bryant A, Griffin MF, Martin-Hirsch PP, Forbes CA, Jepson RG. Interventions targeted at women to encourage the uptake of cervical screening. *CDS Rev*. (5):2011;(5): CD002834. <http://dx.doi.org/10.1002/14651858.CD002834.pub2>.
- Kumar Y, Mishra G, Gupta S, Shastri S. Cancer screening for women living in urban slums – acceptance and satisfaction. *Asian Pac J Cancer Prev*. 2011;12(7):1681–1685.
- Mauad EC, Nicolau SM, Moreira LF, Haikel Jr RL, Longatto-Filho A, Baracat EC. Adherence to cervical and breast cancer programs is crucial to improving screening performance. *Rural Remote Health*. 2009;9(3):1241.
- Muckaden MA, Marathe M, Tulshan R, Carvalho M, Pinto M. Psychosocial issues faced by women with incurable cervical cancer in India – how can we help? *Indian J Palliat care*. 2005;11(2):94.
- Uddin N, Fateem E, Hablas A, et al. Public and professional educational needs for downstaging breast cancer in Egypt. *J Cancer Educ*. 2012;27(1):149–155. <http://dx.doi.org/10.1007/s13187-011-0282-3>.
- Al-Amoudi SM, Abduljabbar HS. Men's knowledge and attitude towards breast cancer in Saudi Arabia. A cross-sectional study. *Saudi Med J*. 2012;33(5):547–550.