



## Breast Cancer Literacy amongst Office Going Women of Delhi

Anita Khokhar\*

Community Medicine, Vardhman Mahavir Medical College and Safdarjung Hospital, India

### Abstract

**Introduction:** Breast cancer has steadily increased over the past decade to become the commonest form of cancer among women in India.

**Material and Methods:** The present cross-sectional, descriptive study was done in the year 2016. The instrument was adapted from Langer's Comprehensive Breast Cancer Knowledge Test (CBCKT) after making some modifications as such a tool was not available for Indian population.

The sample size was calculated assuming p to be 50%. Sample size to be included for the purpose the study was calculated to be 425. The sample size could be reached in 8 of the training programmes conducted in the year 2016.

For a particular statement more than 50% correct responses was taken to be "good knowledge" and below that as "poor knowledge".

**Results:** Out of a total of 425 participants the mean age was 37.8 years. 256 (60.2%) of women had good knowledge about breast cancer being more common in women over 40 years. Least correct response was given for the statement that wearing tight bra could lead to irritation and breast cancer as only 42 (9.9%) knew that it was a wrong statement. There was good knowledge regarding only one symptom i.e. discharge of blood from the nipple was known to a maximum of 358 (84.2%) women correctly as a sign of breast cancer. Regarding screening of breast cancer maximum correct responses were given to the statement that Breast self examination is to be done by the lady herself 256 (60.2%) and that mammography is an X-ray of the breast 241 (56.7%). Regarding management maximum correct response was given for the statement that breast biopsy is required to confirm the diagnosis of breast cancer and is must before starting the treatment 214 (50.3%). Those with graduation and above as educational qualification had a significantly higher knowledge about the statements discharge of blood from a nipple is a symptom of breast cancer, Breast self exam is to be done by a lady herself and mammogram is an X-ray of the breasts  $p < 0.05$ .

### OPEN ACCESS

#### \*Correspondence:

Anita Khokhar, Community Medicine,  
Vardhman Mahavir Medical College and  
Safdarjung Hospital, India,  
E-mail: anitakh1@yahoo.com

Received Date: 19 Jan 2018

Accepted Date: 20 Feb 2018

Published Date: 13 Mar 2018

#### Citation:

Khokhar A. Breast Cancer Literacy  
amongst Office Going Women of Delhi.  
*Clin Oncol.* 2018; 3: 1430.

**Copyright** © 2018 Anita Khokhar. This  
is an open access article distributed  
under the Creative Commons Attribution  
License, which permits unrestricted  
use, distribution, and reproduction in  
any medium, provided the original work  
is properly cited.

**Keywords:** Breast cancer literacy; Office going women; Delhi

### Objectives

To study the breast cancer literacy of office going women with respect to symptoms, high risk factors, screening treatment and management.

### Introduction

Breast cancer is the commonest female cancer worldwide and now also the commonest cancer to affect women in India. There has been many fold increase in incidence of this type of cancer amongst women in India over the past few decades. Not only more number of cases are occurring also the mortality is high in this region due to multiple reasons like low cancer literacy or cancer deficit leading to delay on the part of patient to seek treatment, referral service required to a specialist centre, inadequate cancer treatment facilities etc. The socio-cultural milieu of this country is such that women have barriers in discussing the problem. The disease presents a decade earlier in Indian population and being a developing country we also have a larger base of younger population. Health literacy is defined as the degree to which individuals have the capacity to obtain process and understand basic health information and services needed to make appropriate health decisions [1]. In such a situation it is of utmost importance that our population has adequate cancer literacy which can help in improved screening and early diagnosis, better treatment and follow up of patients. Against this background the present study was planned among women of Delhi, a metro city where breast cancer rate is one of the highest amongst women in India.

**Table 1:** Response of study participants to statements on risk factors of breast cancer N=425. Correct statement=a and incorrect statement=b.

Statement	Yes n(%)	No n(%)	Don't know n(%)
i) Early menarche increases the risk of BC <b>a</b>	115(27.05)	89(20.9)	221(52)
ii) Women with delayed menopause are at a higher risk <b>a</b>	198(46.6)	83(19.5)	144(33.9)
iii) Use of Oral Contraceptive pills increases the risk of BC in some women <b>a</b>	134(31.5)	98(23.05)	193(45.4)
iv) Breast feeding reduces the risk of developing BC <b>a</b>	207(48.7)	51(12)	167(39.3)
v) Physical exercise reduces the risk of developing BC <b>a</b>	155(36.5)	69(16.2)	201(47.3)
vi) A hard blow to the chest may increase the chances of BC later in life <b>b</b>	178(41.9)	89(20.9)	158(37.2)
vii) Constant irritation of a tight bra over time may cause BC <b>b</b>	179(42.1)	42(9.9)	204(48)
viii) Being Overweight increases the risk of BC in some <b>a</b>	67(15.8)	90(21.2)	268(63.05)
ix) A woman who bears first child before the age of 30 years is at a higher risk of BC as compared to a woman who bears first child after 30 years of age <b>b</b>	77(18.1)	203(47.8)	145(34.1)
x) Women with no known risk factors of BC rarely get it <b>b</b>	205(48.2)	53(12.5)	167(39.3)
xi) BC is more common in women over 40 years of age as compared to those under 40 years <b>a</b>	256(60.2)	49(11.5)	120(28.2)
xii) Most frequently occurring cancer in women is that of Breast. <b>a</b>	105(24.7)	95(22.3)	225(53)
xiii) Most breast lumps are cancerous <b>b</b>	97(22.8)	41(9.6)	287(67.5)
xiv) Certain non-cancerous lumps may increase the chance of BC in women <b>a</b>	67(15.8)	56(13.2)	302(71.05)
xv) Wearing red colour bra increases the risk of BC <b>b</b>	73(17.2)	43(10.1)	309(72.7)
xvi) HRT at the time of menopause is safe and does not increase the risk of BC <b>b</b>	98(23.05)	178(41.9)	149(35.05)
xvii) Genetic cause is responsible for most of the BC <b>b</b>	256(60.2)	70(16.5)	99(23.3)
xviii) BC rarely affects women over 60 years of age <b>b</b>	80(18.8)	181(42.6)	164(38.6)
xix) Intake of trans fatty acids in the diet increases the risk of BC in women <b>a</b>	102(24)	33(7.8)	290(68.2)
xx) Radiation therapy at a younger age may increase the risk of BC <b>a</b>	67 (15.8)	57 (13.4)	301 (70.8)

**Table 2:** Response of study participants to statements on breast cancer symptoms=425. Correct statement=a and incorrect statement=b.

Statement	Yes n(%)	No n(%)	Don't know n (%)
i) Pain in the breast is first sign of breast cancer <b>b</b>	212(49.9)	58(13.6)	155(36.5)
ii) Change in shape or size of the breast may be a sign of BC <b>a</b>	197(46.35)	54(12.7)	174(40.9)
iii) A lump or swelling in the armpit is not a sign of BC <b>b</b>	88(20.7)	43(10.1)	294(69.2)
iv) Painless lump in the breast is a common presentation of BC <b>a</b>	104(24.5)	187(44)	134(31.5)
v) Discharge of blood from a nipple may be a sign of BC <b>a</b>	358(84.2)	21(4.9)	46(10.8)
vi) Pulling of the nipple inwards( retraction or inversion) may be a sign of BC <b>a</b>	184(43.3)	98(23.05)	143(33.6)

## Materials and Methods

The present cross-sectional, descriptive study was done in the year 2016. As a part of ongoing health promotion initiative on breast cancer awareness and early detection training programmes were conducted for office going women of Delhi and the data collection was done before the workshop with the help of a semi-structured self administered questionnaire. The instrument was adapted from Langer's Comprehensive Breast Cancer Knowledge Test (CBCKT) after making some modifications as such a tool was not available for Indian population [2].

Questions were added based on the local prevailing factors and those pertaining to American population were removed. The self administered questionnaire was bilingual having questions in both Hindi and English. It was validated in a group of women before the commencement of the study. Questions pertaining to health literacy with respect to symptoms of breast cancer, high risk factors, screening, investigations and treatment were incorporated in form of statements. Further, also evaluation of correct and incorrect responses was done. The sample size was calculated to estimate the proportion of women having adequate knowledge with 95% confidence level

and 5% allowable error. As estimates for proportion of office going women having adequate knowledge were not available for the region, we assumed that 50% of the women had adequate knowledge in order to get the maximum sample size which was calculated to be 383. Another 10 per was added for non responses and sample size to be included for the purpose the study was calculated to be 425. The sample size could be reached in 8 of the training programmes conducted in the year 2016.

For a particular statement more than 50% correct responses was taken to be "good knowledge" and below that as "poor knowledge". Socio-demographic variables were studied against the responses and Chi square test to check the statistical significance was applied. p value less than 0.05 was taken to be statistically significant.

## Results

Out of a total of 425 participants, all were women as the training programmes were organized only for women office goers. The mean age was 37.8 years. 403 (94.8%) of the participants were Hindus by religion. 141 (33.3%) were senior secondary school pass, 119 (28%) were graduates, 97 (22.8%) were postgraduates and 68 (16%) were having a professional degree. 20 statements regarding high risk factors

**Table 3:** Response of study participants to statements on screening of breast cancer N=425. Correct statement=a and incorrect statement=b.

Statement	Yes n(%)	No n(%)	Don't know n (%)
i)Breast self is to be done by a lady herself <b>a</b>	256(60.2)	31(7.3)	138(32.5)
ii) Clinical breast exam should be done at least once a year after 40 years of age <b>a</b>	96(22.6)	42(9.9)	287(67.5)
iii)Mammography is an X ray of the breasts <b>a</b>	241(56.7)	23(5.4)	161(37.9)
iv)Mammography should be done after the age of 40 years as before that it is not effective as breasts are dense <b>a</b>	79(18.6)	58(13.6)	288(67.8)
v)Mammography can be done by any doctor <b>b</b>	68(0.2)	215(50.6)	142(33.4)
vi)Screening is required for those women who have a family history of breast cancer <b>b</b>	178(41.9)	52(12.2)	195(45.9)

**Table 4:** Response of study participants to statements on management of Breast Cancer N=425. Correct statement=a and incorrect statement=b.

Statement	Yes n(%)	No n(%)	Don't know n(%)
i)Mammography confirms BC in all women <b>b</b>	245(57.6)	29(6.8)	151(35.5)
ii)Ultrasound is not an investigation done for breast related problems <b>b</b>	82(19.3)	96(22.6)	247(58.1)
iii)Breast biopsy confirms the diagnosis and is must before starting the treatment for BC <b>a</b>	214(50.3)	21(4.9)	190(44.7)
iv)For many women BC can now be treated without removal of breast(mastectomy) <b>a</b>	59(13.9)	245(57.6)	121(28.5)
v)By the time a cancerous breast lump is painful, it is too late to be successfully treated and cancer cannot be cured <b>b</b>	98(23.05)	73(17.2)	254(59.8)
vi)BC is sometimes treated successfully by removal of the lump(lumpectomy) and radiation therapy <b>a</b>	187(44)	60(14.1)	178(41.9)
vii)BC is less likely to be cured in a woman with a history of BC as compared to those without history of BC <b>b</b>	106(24.9)	130(30.6)	189(44.5)
viii)By the time a woman feels a cancerous lump it is too late to treat it effectively <b>b</b>	115(27.05)	165(38.8)	145(34.1)
ix)Even if the breast cancer is detected early, chances of cure are better if the whole breast is removed <b>b</b>	267(62.8)	97(22.8)	61(14.3)
x) Once completely treated BC does not come back <b>b</b>	164(38.6)	201(47.3)	60 (14.1)

**Table 5:** Association between socio-demographic factors and breast cancer literacy.

	Statements	p<0.05,significant
Educational Qualification of graduation and more	Discharge of blood from nipple as a symptom of BC	<0.05,significant
	Breast self examination is to be done by a lady herself	0.00,significant
	Mammography is an X-ray of the breasts	0.01,significant

were administered to women to respond. 256 (60.2%) of women had good knowledge about breast cancer being more common in women over 40 years as compared to those under 40 years. Least correct response was given for the statement that wearing tight bra could lead to irritation and breast cancer as only 42 (9.9%) knew that it was a wrong statement. Regarding symptoms related to breast cancer 6 questions were asked, there was good knowledge regarding only one symptom i.e. discharge of blood from the nipple was known to a maximum of 358 (84.2%) women correctly as a sign of breast cancer. Pain in the breast as the first sign of breast cancer was the incorrect answer and only 58 (13.6%) gave the correct response. Regarding screening of breast cancer six questions were asked maximum correct responses were given to the statement that breast self examination is to be done by the lady herself 256 (60.2%) and that mammography is an X-ray of the breast 241 (56.7%), the least correct response was given to the statement that screening for breast cancer is required only for those women who have a family history of breast cancer by 52 (12.2%).

Ten statements were administered regarding management of breast cancer. Maximum correct response was given for the statement that breast biopsy is required to confirm the diagnosis of breast cancer and is must before starting the treatment 214 (50.3%). 267(62.8%) wrongly believed that even if breast cancer is detected early, chances for cure are better if whole breast is removed. Those with graduation and above as educational qualification had a significantly higher knowledge about the statements discharge of blood from a nipple is

a symptom of breast cancer, Breast self exam is to be done by a lady herself and mammogram is an X-ray of the breasts as compared to those women who had educational status of lower than graduation  $p < 0.05$ .

## Discussion

In our study 48.7% correctly knew that breast feeding decreases the risk of breast cancer. In a study by Dey et al. [3] 75.3% correctly knew this in another study by Ahmed et al. [4] In Karachi, 96.4% of them were aware; this was higher than our study. The reason for this difference may be that in their study the study population consisted of nurses working in a hospital and even some from oncology wards. In a study by Bhandari et al. [5] among higher secondary students from Nepal 46.6% knew the correct answer. In a study among school teachers conducted in Delhi 59.2%, knew that women who did not breast feed were at a higher risk to develop breast cancer [6] 6.8% of the women in another study conducted in Delhi stated that not breast feeding increased the risk of breast cancer [7]. This shows that women need to be educated about the benefits of breast feeding on continuous basis as this practice is beneficial to both the mother and the baby in more than one way.

In our study 36.5% correctly knew that physical activity decreases the risk of breast cancer which shows that benefits of physical activity are still not known to women. Bhandari et al. [5] observed it to be 59.4%.

53% of the students were correctly responded that the exercise reduces the chances of breast cancer in another study conducted in Pakistan by Murtaza et al. [8].

20.9% wrongly believed that a blow to chest increased the risk of breast cancer for a lady later in life. Same factor was also studied by others and their results were 24.6%, 35.3% and 2.35% respectively [4,5,7].

42.1% incorrectly believed that irritation by a tight bra could cause cancer. 59.4% in a study by Ahmed gave correct response to this statement and 17.7% in study by Bhandari et al. [5], believed that tight bra could be risk factor for breast cancer. However, a lower proportion (6.2%) of women from Delhi thought this to be true [4,5,7]. There are certain myths and misconception in the women regarding trauma to the chest, colour of the bra and wearing of tight bra by means of education they need to be clarified and then correct information disseminated.

In our study 15.8% correctly knew that overweight increased the risk of breast cancer. In another study by Khokhar among school teachers of Delhi comparable proportion of 11.6% participants correctly knew that obesity could be a high risk factor for breast cancer whereas in a study by Bhandari a higher proportion of participants (30.7%) answered that correctly. Women in a metro like Delhi are still not aware of all the high risk factors of breast cancer in spite of it being the commonest form of cancer in India to affect women.

In the current study 27.05% correctly knew that early menarche could be a high risk factor for breast cancer, in the study among Pakistani girls 55% gave the same response. In another study conducted in Delhi, lower proportion of 7.7% gave correct answer to this statement. Premature onset of menses was perceived to be a high risk factor of breast cancer by 55% of Pakistani girls and 7.7% of women from Delhi [7,8]. Women need to know about the non-modifiable risk factors of breast cancer also like menarche. It may help them in better understanding the perceived risk of this disease.

In our study 47.8% correctly knew that bearing a child before 30 years of age is not a risk factor for breast cancer in a study by Bhandari et al. [5] this fact was known to 59%. 33% of the participants in another study correctly answered that first child after exceeding increased the risk of breast cancer [8]. Due to change in lifestyle and westernization age more and more number of women are now having first child after 30 years of age.

In the current study only 15.8% correctly knew that radiation therapy at a younger age increased the risk of breast cancer for a woman at a later date. Frequent X-ray exposure can lead to breast cancer was also correctly answered by 48% of participants as reported by Murtaza et al. [9] and 17.6% by Khokha [7,8].

24% of the women correctly responded that trans- fats in the diet could increase the risk of breast cancer. In another study by Khokhar where it was asked whether diet, pesticides or food adulterants increased the risk of breast cancer response was higher (67.5%) [7]. There has been wide coverage in media in Delhi on pesticides and food adulterants and their possible affect on health of consumers.

Change in shape of the breast as a sign of breast cancer was correctly known to 46.35%, painless lump in the breast as a symptom of breast cancer was known to (24.5%) and pulling in of the nipple inwards to (43.3%). Knowledge about discharge of blood from nipple (84.2%) was good. In another study done in Delhi chest in the shape

and size of breast as a sign of breast cancer was known to 25.9%, change in the shape of nipple to 29.4% and discharge from nipple to 23.2% [7]. This is the most crucial part of cancer literacy that a person is able to detect the disease at the earliest and that can happen only ones she is aware of all the signs and symptoms correctly.

18.6% of our participants correctly answered that mammography should be done only after 40 years of age and before that it is not effective as breasts are dense. Higher percentage (68%) of participants responded correctly to this question in another study [8].

In our study only 12.5% correctly responded that even without any known breast cancer risk factor a lady could have breast cancer and similar observation (13.1%) was made by Bhandari et al. [5]. This point needs to be emphasised more so that all the women realize that they are at a risk of getting breast cancer and not only those with a family history.

Our women when asked if women over 40 years were at a greater risk of breast cancer 60.2% responded in affirmative whereas in another study by Dey et al. [10] a lower proportion of 49.3% were aware of the same [3].

There was low level (24.7%) of knowledge about the fact that breast cancer is the commonest form of cancer to affect women in India as compared to 49.5% in another study [5]. Women in Delhi are still not aware that breast cancer is common in India.

Only 9.6% participants in our study knew that all lumps are not cancerous whereas a higher proportion of 43.1% had correct information regarding this study from Nepal [5]. When it comes to breast lump and chances of it being cancerous, there is confusion in the minds of women. It needs to be clarified that some lumps may be non cancerous.

15.8% of the participants in our study correctly knew that certain non-cancerous lumps could predispose to breast cancer whereas in a study by Dey et al. [10] a much higher (80%) proportion of participants were aware of the same [3].

In our study 17.2% believed in the myth that red colour bra could predispose to breast cancer in study by Dey et al. [10] 33.6% believed that underwire bras could lead to the same.

It was a common belief (60.20%) that genes were responsible for most cases of breast cancer in our study whereas in study by Dey et al. [10] 39.6% were of the opinion that breast cancer is usually inherited [3].

In our study only 13.9% (knew that breast cancer could be successfully treated by mastectomy whereas Bhandari, et al. reported it to be 39.9% [5]. The figure may be lower in our study as usually women associate treatment of breast cancer with multiple modalities and not just one.

17.2% in our study believed that by the time lump becomes painful it is too late to be treated similar result (12.8%) was obtained by Bhandari et al. [5]

38.8% in our study responded that by the time a lady could feel the lump it was too late to be effectively treated whereas Bhandari et al. [5] reported it be 16.9%.

62.8% in our study incorrectly believed that whole breast removal offered better chance for cure even when breast cancer was caught early, 18.6% in study by Bhandari believed so [5], whereas 50.9% in a

study by Dey, et al. believed that cancer was incurable [3]. This shows women are not aware of treatment options available for breast cancer now a days there was a belief in 41.9% that in spite of early detection and treatment a woman was unlikely to lead a normal life after breast cancer, similar 39.3% observation was made by Bhandari, et al. Women after breast cancer treatment could enjoy a happy life was the response given by 58% of students in study by Murtaza et al. [8]. It reflects the dismal picture that women have of outcome of breast cancer treatment in their minds.

In our study 22.6% women correctly responded to the statement 'Ultrasound is not an investigation done for breast related problems.' In another study done among OPD patients in a hospital at Wardha, none of the women had awareness about ultrasound and mammography the reason may be that women were from rural area and had low literacy. It was seen that as the literacy status increased women with increased level of awareness also increased and this was statistically significant [9]. In our study also women who had education qualification of graduation level and above had better knowledge about the facts that discharge of blood from a nipple is a symptom of breast cancer, Breast self exam is to be done by a lady herself and mammogram is an X-ray of the breasts as compared to those women who had educational status of lower than graduation  $p < 0.05$ .

In the present study 22.6% of women knew that clinical breast exam should be done annually after 40 years of age. In another study the same was reported by 11.8% [10] and in study among nurses in Delhi as expected it was higher at 76.8% [11]. 95.01% of the school teachers in Delhi were aware of the fact breast should be examined by a doctor but none of them knew that after the age of 40 years it should be done annually [6].

In the present study 50.6% correctly knew that mammography could not be just done by any specialist, where as in another study conducted in Delhi, 14.9% of the participants correctly knew that only a radiologist could do a mammogram [10].

A study conducted in African-American women also showed that knowledge of breast cancer screening modalities was somewhat a stumbling block. Only 79.4% of the questions in this domain were correctly answered at baseline. Similar findings pertaining to the cancer awareness domain indicated that even though progress had been made in educating African-American women about breast cancer and cancer in general, these specific domains still needed attention [12].

It is evident; unless the women are imparted literacy about screening guidelines they will not be in a position to practice it. Many studies have confirmed that that women with inadequate self-reported health literacy were less likely to have had a mammogram in the last 2 years [13,14,15]. Screening is the backbone of any cancer programmed which may contribute to down staging of a cancer.

## Conclusion

There is an urgent need for breast cancer literacy programmes at the level of community addressing risk factors, signs and symptoms, screening and management of breast cancer. Also misconceptions and myths associated with breast cancer need to be clarified.

## Acknowledgement

Authors sincerely acknowledge the cooperation of all the women who were a part of this study and the administration of their workplaces.

## References

1. Ratzan SC, Parker RM, Selden CR, Marcia Zorn. Introduction. In: National Library of Medicine Current Bibliographies in Medicine: Health Literacy. Selden CR, Zorn M, Ratzan SC, Parker RM, Editors. NLM Pub. No. CBM 2000-1. Bethesda: National Institutes of Health, U.S. Department of Health and Human Services.
2. Stager JL. The comprehensive breast cancer knowledge test: validity and reliability. *J Adv Nurs.* 1993;18(7):1133-40.
3. Dey S, Mishra A, Govil J, Dhillon PK. Breast cancer awareness at the community level among women in Delhi. *Asian Pac J Cancer Prev.* 2015;16 (13):5243-51.
4. Ahmed F, Mahmud S, Hatcher J, Khan SM. Breast cancer risk factor knowledge among nurses in teaching hospitals of Karachi, Pakistan: a cross-sectional study. *BMC Nurs.* 2006;5:6.
5. Bhandari PM, Thapa K, Dhakal S, Bhochohibhoya S, Deuja R, Acharya P, et al. Breast cancer literacy among higher secondary students: results from across-sectional study in Western Nepal. *BMC Cancer.* 2016;16:119.
6. Khokhar A. Awareness regarding breast cancer and screening amongst Indian teachers. *Asian Pac J Cancer Prev.* 2009;10(2):247-250.
7. Khokhar A. Study on high risk factors of breast cancer amongst working women from Delhi, India. *World J Epidemiol Cancer Prevention.* 2013;2:22-7.
8. MurtazaG, Abbasi SI, Irum H, Jadoon MK, Hussain I. Assessment of breast cancer literacy among female students in a Pakistani university. *Wspolczesna Onkol.* 2011;15 (6):381-4.
9. Rao S, Gupta D, Narang R, Singh P. Knowledge, attitude and practice about breast cancer and breast self-examination among women seeking out-patient care in a teaching hospital in central India. *Indian Journal of Cancer.* 2016;53(2):226-9.
10. Khokhar A. Study on knowledge, experiences and barriers to mammography among working women from Delhi. *Indian Journal of Cancer.* 2015;52 (4):531-35.
11. Khokhar A. Effect of a training programme on knowledge of nurses from a missionary hospital in India regarding breast cancer and its screening. *Asian Pacific J Cancer Pre.* 2012;13(12),5985-87.
12. Mabiso A, Williams KP, Todem D, Templin TN. Longitudinal analysis of domain-level breast cancer literacy among African-American women. *Health Educ Res.* 2010;25(1):151-61.
13. Fernandez DM, Larson JL, Brian J, Zikmund-Fisher. Associations between health literacy and preventive health behaviors among older adults: findings from the health and retirement study. *BMC Public Health.* 2016;16:596.
14. Pagán J, Brown C, Asch D, Armstrong K, Bastida E, Guerra C. Health literacy and breast cancer screening among Mexican American women in south Texas. *J Cancer Educ.* 2012;27(1):132-7.
15. Garbers S, Chiasson MA. Inadequate functional health literacy in Spanish as a barrier to cervical cancer screening among immigrant Latinas in New York city. *Prev Chronic Dis.* 2004;1(4):A07.