

Awareness, Knowledge and Practice of Breast Self-Examination among Women in Majengo Health Center, Moshi Municipality, Kilimanjaro Region, Tanzania: Descriptive Cross-Sectional Study

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Abstract

Background: Currently, Breast cancer is the most frequent cancer among women. Despite being second and first leading cause of morbidity and mortality among women globally and in Tanzania respectively, breast cancer is detected by using potentially recommended breast self-examination (BSE) as cornerstone of breast cancer early detection method.

Objective: To determine awareness, knowledge, practice and barriers of BSE among women attending clinics at Majengo Health center in Moshi municipality, Kilimanjaro region.

Methodology: Hospital based Cross-sectional descriptive study was used. Systemic randomly sampling technique was used to select participants. Respondents interviewed by using semi-structured questionnaire. Data processed and analyzed by using SPSS Version 20.

Results: A total 300 urban women from Majengo health center were studied. Their age ranged from 20-56 with mean age of 28.82 years (SD+6.628). Majority 142(47.3%) have primary level of education and about 197(65.7%) were Self-employed. 95% of women heard about BSE, among them only 26(27%) had adequate awareness in which Mass media like Radio (36%) and Television (25%) were main source of information. 94% knew performing BSE and among them, only 31(33%) had adequate knowledge on performing Breast Self-Examination (BSE).

31% respondents practiced BSE and among them, only 25(26.6%) had regular practice. Lack of knowledge on performing BSE 179(59.7%) was the major Barrier in practicing BSE among respondents.

Conclusion: This work reveals low level and incomplete awareness, knowledge and practice of BSE among women in Moshi municipality.

Recommendation: Effective improvement of health Education covering knowledge and practice of Breast Self-Examination (BSE).

Keywords: Awareness, Knowledge, Practice, Breast Self-Examination

1. Introduction

Currently, breast cancer is one of the most frequently detected cancers and is the major leading cause of death among women globally [1]. Breast cancer is a global health concern and a leading cause of morbidity and mortality among all the cancers that affect women [1]. In 2008, proportion of Breast Cancer in Sub-Saharan Africa was calibrated to be 23.5 per 100,000 [2].

Breast cancer has been notified as a huge public health catastrophe in high Income Countries (HIC), Middle Income Countries (MIC) and Low-Income Countries (LIC) because of its high incidence-prevalence rate, the over-burdened health system and direct medical expenditure [3]. Globally statistical perspectives, accounted double increment of annual incidence of Breast Cancer,

occurring more rapidly in countries with a low incidence rate of breast cancer [4,5].

Finding from MEWATA and Morse et al., 2014 in Tanzania [6]. show that BC is the leading cause of deaths among women compared to all other cancers affecting women. Forty thousand (40,000) BC associated deaths are estimated to occur each year [6]. Thereby representing almost hundred percent increment of Breast Cancer Burden. This is supported by the literature showing a rise in breast cancer incidence rates in Sub-Saharan Africa [7]. The high incidence of breast cancer necessitates the requirements for early identification and detection because this would provide wide room of the treatment options available to the affected women and thereby improve survival rates [8]. Other studies revealed that in most of the Low-income countries (LIC) with limited resources, breast cancer is detected in a late advanced stage of the disease when compared with Higher Income Countries (HIC) and thus has a poor outcome and high fatality rate [1,9-16]. Screening for early detection and diagnosis of Breast Cancer and breast health conditions and health position is an important public health principle [17].

Breast self-examination (BSE) is a check-up that a woman/Female do by herself around her breast at home to look for abnormal changes or problems affecting the breast tissue. BSE is still recommended as a general approach and cornerstone in a higher increment of breast health awareness and thus potentially allow for early diagnosis of any anomalies because it is free, painless and easy to practice, costless, not time consuming [18]. Currently, It is recommended that women with age of 20 years should be educated on the pros and cons of performing a monthly BSE [16]. "Breast Cancer awareness" literally should proceed among women and make them to present early to hospital and be able to recognize symptoms of breast cancer [19]. Some literatures reported that factors related to women's knowledge about breast cancer and practice of BSE and its management may add effective potential advantage to medical help-seeking behaviors' [19,20]. Recent studies in Angola, Nigeria, Senegal and Kenya shown low level of awareness and knowledge on Breast Self-examination as recommended way of detecting early warning signs of Breast Cancer [21-26]. Presence of poor understanding of barriers associated with Breast Self-examination discourages most women from seeking early intervention or even to admit that symptoms they may be experiencing are related to breast cancer and even not practicing BSE or practicing it irregularly. Due to double increment of Breast Cancer Mortality and its morbidity accompanied with low and insufficient awareness, Knowledge and Practice of BSE among women, there is huge need for a study to determine and assess awareness, Knowledge and practice of BSE among women in our communities. Therefore, this study aimed to determine and assess awareness, knowledge and practice of breast self-examination among Urban women attending Clinics at Majengo Health Center, Moshi Municipality, Kilimanjaro Region, Tanzania.

2. Methods

2.1. Study Design and Sampling Method

A cross-sectional study was carried out among urban women attending Clinics at Majengo Health Center between 25th March, 2017 and 21st May, 2017 in Moshi municipality, Kilimanjaro, region, Tanzania.

A Systemic random sampling method was used to select women who attended Clinics at Majengo Health Center. A total of 300 urban women met the inclusion criteria and had given informed consent to participate in the study. The inclusion criteria for this study was; women aged between 20 and 65 years old. This study obtained approval from the Ethical Committee of Kilimanjaro Christian Medical University College (KCMUCo). Permission from Moshi Municipal director and from doctor in charge of Majengo Health center to interview women aged between 20 and 65 years who met inclusion criteria attending clinics at Majengo Health center from 25th March, 2017 to 31st May, 2017 was granted.

2.2. Instrument

Data was collected via a structured questionnaire which was developed by the researcher based on an extensive review of the literature. The content validity was evaluated by experts from Community Health Department at Kilimanjaro Christian Medical University College (KCMUCo) to examine each item for congruence. The reliability of the questionnaire was determined by using test-retest reliability conducted among ten (10) Urban women attending Clinics at Bondeni Dispensary in to test flow, language understood between respondents and researcher/Skilled trained research assistants' data collectors, consistence and to ensure effectiveness of data collection tool. Necessary corrections and adjustments of the tool were made before going to the field.

The questionnaire obtained information on respondents' socio demographic characteristics, awareness of breast cancer and BSE, Knowledge on BSE, barriers for BSE practice, practice of BSE and source of information. Socio demographic variables included: age, marital status, family income, family history of breast cancer (yes/no), personal history of breast disease (yes/no), hormonal drug usage (yes/no) and check the breast by doctor (yes/no). Questionnaires were translated in Swahili language because most of the participants understand well the language and for easy collection of information.

2.3. Analysis

Descriptive statistics (Mean, range, tables, figures and graphs) were used to summarize and present data. Data was processed and analyzed by using SPSS Version 20. Descriptive statistics (Mean, range, tables, figures and graphs) were used to summarize and present data. Awareness on BSE of respondent was analyzed by finding the proportional of women with awareness on BSE. This was done by taking number of women who were aware on BSE divide by total number of respondents included into the study. Information on awareness of women on BSE, in which being aware and not aware of BSE among respondents was analyzed.

For respondents who were aware of BSE on this section which contain three (3) questions, Women’s level of awareness on BSE was analyzed based on a two scales (“1”, “0”). A score of ‘1’ was awarded for a correct response while a score of ‘0’ was awarded for wrong response, and a total score computed for each woman out of maximum score of 3. The women’s awareness on BSE was categorized into two; adequate awareness which was considered for those who scored 2 and above out of 3 and Inadequate awareness which was considered for those who had score of 1 and below out of 3.

Knowledge on BSE was analyzed by finding the proportion of women with knowledge on BSE. This was done by taking number of women who know about BSE divide total number included into the study. Information on knowledge on BSE of women which contain thirty-teen (13) questions in which being knowledgeable and Non-knowledgeable was determined. For respondents who were Knowledgeable on BSE, their level of knowledge was determined based on a two scales (“1”, “0”). A score of ‘1’ was awarded for a correct response while a score of ‘0’ was awarded for wrong response, and a total score computed for each woman out of maximum score of 13. The women’s knowledge on BSE was categorized into two; adequate knowledge was which considered for those who had score of 7 and above out of 13 and Inadequate knowledge which was considered for those who had score of 6 and below out of 13.

BSE practice was analyzed by finding proportion of women who practice BSE. This was done by taking number of women

practicing BSE divide by total number of respondents included into the study. Information on practice of BSE in which being regularly (For those who practiced BSE at right time with respect to menstruation, correct required interval periodic time and correct posture on performing BSE) or irregularly (For those who practiced BSE at right time with respect to menstruation, correct required interval periodic time and correct posture on performing BSE or perform one or two option correctly) BSE among respondents was analyzed.

Barriers on practicing BSE was analyzed according to each barrier as categorical data in terms of percentage and frequency.

3. Results

3.1. Respondent Rate

A total of 300 urban women attended were selected as the sample of the study. However, 1

(0.3 %) refused to participate. The respondents’ rate derived in this study was 99.7%.

3.2. Social Demographic and Economic characteristics of the Participants

A total of 300 urban women from Majengo health center participated in this study. table 01 summarizes Social Demographic and Economic characteristics of the participants. Participants’ age ranged from 20 – 56 with mean age of 28.82 years (SD±6.628). Most of them are at the age category of 20-29 which accounted to 188(62.7%).

Characteristics	Frequency (n)	Percentage (%)
Age (in years)		
Age group (in years)		
20-29	188	62.7
30-39	90	30
40-49	19	6.3
50-59	3	1
60+	0	0
Mean(±SD) of age	28.82 (6.628)	
Range of age	20-56 (36)	
Education level		
None	3	1
Primary	142	47.3
Secondary	140	46.7
Post-secondary	15	5
Marital Status		
Currently married	237	79
CurrentlynotMarried		
Single	63	21
Number of Parity		
1	137	45.7

2-3	136	45.3
>3	27	9
Tribe		
Chaga	220	73.3
Pare	60	20
Sambaa	20	6.7
Occupation		
Employed	16	5.3
Self-employed	197	65.7
Housewife	87	29
Religion		
Christian	208	69.3
Islamic	92	30.7

Table 1 : Socio-Demographic Characteristics of the Study Respondents Women

3.4. Awareness on BSE

Mass media such as Radio and TV were identified as the main source of information on Breast Self-Examination by 36% and

25% of respondents' women who were aware of Breast Self- Examination respectively followed by relatives (19%).

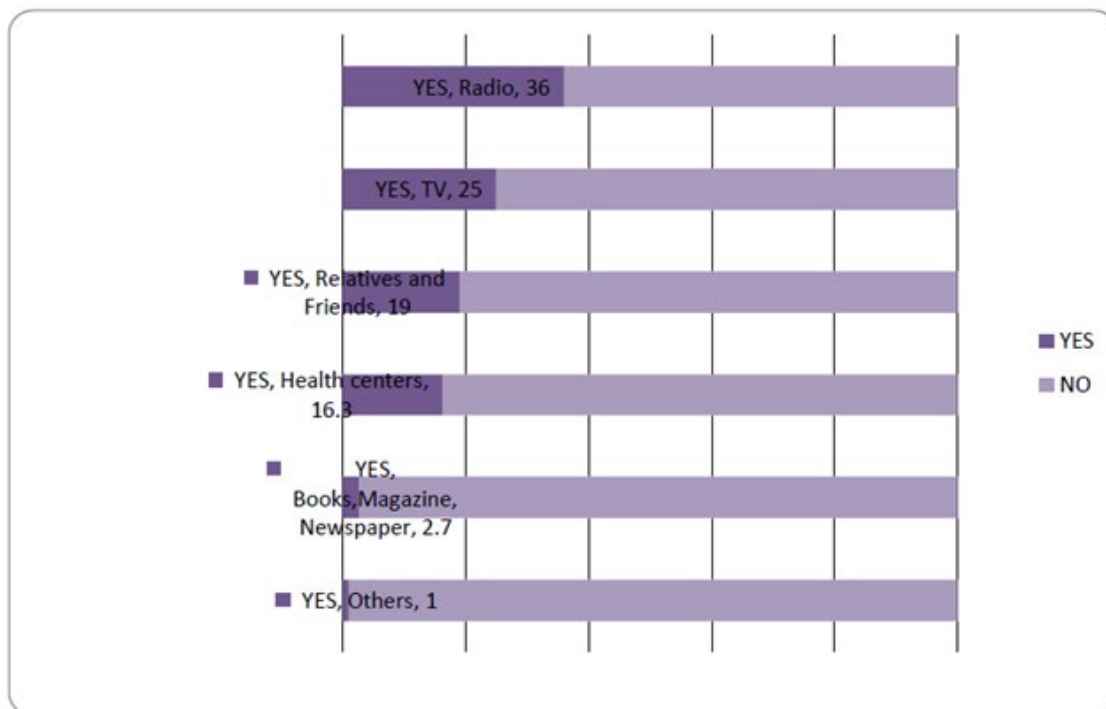


Figure 1: Source of Information on BSE among Respondents (N=300)

Less than half of the women 95(31.7%) among 300 respondents' women heard about Breast Self-Examination, among those who heard (95 respondents' women) about Breast Self- Examination, only less than half 26(9%) had adequate level of awareness on Breast Self- Examination.

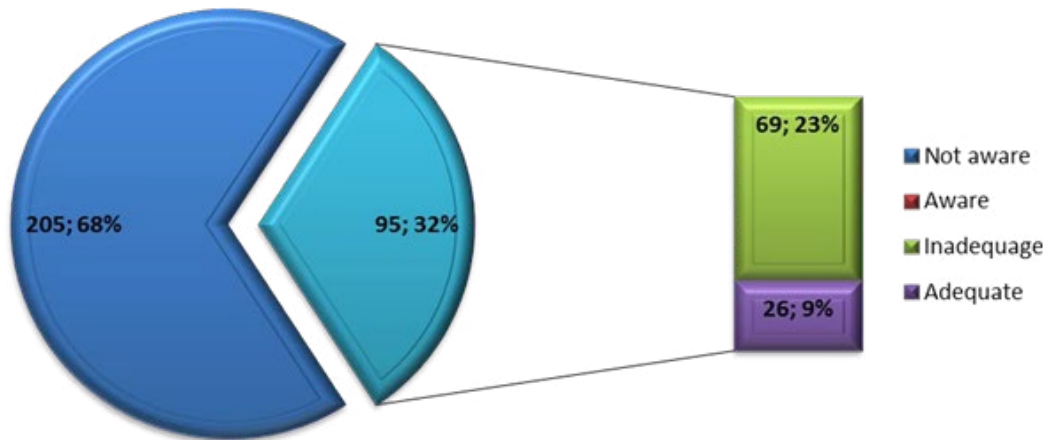


Figure 2: Awareness on BSE among Respondents (N=300)

3.5. Knowledge on BSE

Fewer than half of the respondents' women 94 (31.3%) among 300 respondents had knowledge on performing Breast Self-Examination (BSE). Majority 108(36%) of knowledgeable women on performing BSE reported learning about it from TV and /or Radio program while others learnt it from school lectures 96(32%), arranged seminars 69(23%), clinics 24(8%) and Books/Magazine/ Newspaper(3(1%)). Few 3(1%) respondents knew the appropriate age (20 years) for starting practicing BSE among women. Less than half 76(25.3%) of respondents women knew the appropriate time (with respect to menstruation period which is before, after and mid-cycle) for performing Breast Self-Examination BSE.

Only 94(31.3%) respondents' women out of 300 knew the correct postures when performing BSE. Only 108 (36%) of the respondents can detect early signs of Breast cancer. Majority 189(63) of respondents women strongly agreed that interval of every month for performing BSE is the best. Most 76(25.5%) of the respondent women strongly agreed BSE is best method for detecting early signs of Breast cancer. Among those who were knowledgeable (94 respondents' women) about performing Breast Self- Examination, only less than half 31(33%) had adequate level of Knowledge on Breast Self- Examination Table 02 summarizes Knowledge on BSE among respondents.

Variables	Frequency (n)	Percentage (%)
Knowledge on performing BSE		
Yes	94	31.3
No	206	68.7
Source of knowledge about BSE practice		
Clinics	24	8
Books, Magazine,		
Newspaper	3	1
'TV and Radio program'	108	36
Arranged seminars	69	23
School lectures	96	32
Knowledge on appropriate Age (in years) for starting performing BSE		
Correct answer	3	1
Incorrect answer	49	16.3
Do not know	248	82.7
Knowledge on appropriate time(With respect to menstruation period) for performing BSE		
Correct answer	76	25.3
Incorrect answer	24	8
Do not know	200	66.7

Knowledge on postures when performing BSE		
Correct answer	94	31.3
Incorrect answer	6	2
Do not know	200	66.7
Knowledge on detecting early signs of Breast cancer when performing BSE		
Correct answer	108	36
Incorrect answer	27	9
Not sure/Don't know	165	55
Frequency of performing BSE once a month is best		
Strongly agree	189	63
Somehow agree	45	15
Strongly disagree	66	22
Somehow disagree	0	0
No option Best method for early detection of Breast cancer		
Breast Self-examination	76	25.5
Clinical Breast examination	39	13
Mammogram	3	1
Do not know	182	60.7
Level of Knowledge on BSE among knowledgeable respondents		
Adequate Knowledge	31	33
Inadequate Knowledge	63	67

Table 2: Knowledge on BSE among Respondents (N=300)

3.6. Practice of BSE

Less than half 94(31.3%) out of 300 total participants, reported to practice BSE. About 30 (10%) respondents reported to perform BSE in a correct periodic interval of every month. Among those respondent women who reported not practicing BSE which were 206(68.7%) out of 300 respondent women, their commonest

reason for not practicing BSE was Forgetfulness 260 (86.7%)” Of the respondents who practice BSE (94 respondents’ women out of 300 total participant), only less than half 25(26.6%) practice BSE regularly. Table 03 summarizes practice of BSE among respondents.

Variables	Frequency (n)	Percentage (%)
Practice/ performing BSE		
Yes	94	31.3
No	206	68.7
Time period for performing BSE		
After everyday	6	2
After every week	16	5.3
After every month	30	10
Do not know/don't		
remember.	233	77.7
Others	15	5
Reasons for not performing BSE		
Do not know to	0	0
perform.	179	59.7

Fear of positive finding.	76	25.5
Forgetting	107	35.7
Not interested	260	86.7
Not sure of its ability in detection	44	14.7
	174	58
Level of BSE practice among those who practice BSE		
Regular	25	26.6
Irregular	69	73.4

Table 3: Practice of BSE among Respondents (N=300)

3.7. Barriers on practice BSE

Majority of respondents (88.7%) reported lack of family history of breast cancer so why bother doing it, Forgetfulness (260(86.7%)), Lack of motivation/ influence from the society (219(73%)), Lack

of Knowledge of performing BSE (179(59.7%)) and Lack of Self-confidence 74(58%) as their commonest barriers in practicing BSE. Table 4 summarizes barriers on practicing BSE among respondents.

Variables	YES		NO		DON'T KNOW/NOT SURE	
	N	%	N	%	N	%
Lack of awareness about BSE						
Lack of Knowledge performing BSE	179	59.7	100	33.3	21	7
Fear of finding abnormal mass	107	35.7	190	63.3	3	1
Lack of time	36	12	264	88	0	0
Lack of Self confidence	174	58	119	39.7	7	2.3
Is not necessary	32	10.7	213	71	55	18.3
Forgetfulness	260	86.7	40	13.3	0	0
Dislike Touching Breast	21	7	251	83.7	28	9.3
Reluctance to practice BSE	17	5.7	81	27	202	67.3
Lack of motivation/influence from						
the society	219	73	81	27	0	0
Not at risk	44	14.7	201	67	55	18.3
Embarrassing behavior	27	9	212	70.7	61	20.3
No family history of breast cancer	266	88.7	17	5.7	17	5.7

Table 4 : Barriers on Practicing BSE among Respondents (N=300)

3. Discussion

Breast cancer is the second underlying cause of women death globally and is the leading cause of death in Low Income Countries (LIC) including Tanzania [6]. Early detection of warning signs of Breast cancer is well identified by screening method like Breast Self-Examination (BSE). Awareness/Knowledge on BSE practice among women is crucial and considered as a key for practice of BSE in order to detect early signs of Breast cancer in order to prevent breast cancer among women [7].

Awareness of a disease like breast cancer precedes knowledge and screening practices (Breast Self-Examination). Patients in communities with high level of awareness is usually present with less advanced stages of breast cancer as a result of adoption of screening methods like Breast Self-examination [27]. In this study

95(31.7%) were aware of BSE and among them, only 26(27%) had adequate awareness concerning BSE and their main source of information was Mass media like Radio and TV. Due to low level of awareness among respondents found in this study, means most of women in community not have information about BSE and this will lead to low practice of BSE because this will act as barrier toward practicing BSE among women who not aware. These findings contradict those reported in other studies done in different areas with different populations. Self-breast examination awareness level varied among populations; it was reported to be very high awareness of BSE among respondents in a study done in Tanzania and Nigeria [28-39,6]. However similarly low BSE awareness was reported in studies done in Nigeria [33]. In sub urban and urban communities 52.8% claimed to have heard about BSE 52.8% attested that they have heard about breast self-examination

[40]. Possibly reasons for high awareness compared to this study is because of among those studies, respondents reported to have more exposure to sources of information and society influence than in this study. Possible reasons for low awareness in some study is because of some studies have been done in the rural areas where there is low exposure of participants to Mass media compared to this study done in urban setting. However more awareness will bring influence of knowledge on BSE practice among women.

Knowledge has positive influence on disease like breast cancer and precedes screening practices (Breast Self-Examination). Patients in communities with high level of knowledge on BSE is usually present with less advanced stages of breast cancer as a result of adoption of screening methods like Breast Self-examination. In this study out of 300 total respondents only less than half 94(31.3%) knew how to perform BSE and among them only 31(33%) had adequate knowledge concerning BSE. Majority of the respondents 108(36%) obtained their knowledge of performing BSE from TV and radio program. Due to low level of Knowledge among respondents found in this study, means most of women in community not have Knowledge about BSE and this will lead to low practice of BSE because this will act as barrier toward practicing BSE among women who not knowledgeable on BSE. This is contrary compared with other studies in which it was reported that, respondent had less than 50% of knowledge on how to perform BSE as in this study, like study done in urban southwest Nigeria done by Oladimeji et al., 2015 reported only 29.2% and similar study in Northern Nigeria done by Azubuike et al., 2015 reported only 46.1% [7,41]. Other study done in Nigeria showed to be slightly more than 50% which reported only 54% knew how to perform BSE compared to this study. Also from this study only 76(25.3%) Knew the correct time that Before/after and mid-cycle is the correct time to perform BSE and majority 200(66.7%) of respondents don't know appropriate time (with respect to menstruation period) for performing BSE which is slightly lower compared with the similar study done in Nigeria by Oladimeji et al., 2015 reported that out of 271 total participants responded to the question of when is the right time to perform BSE. Only 8.1% of these knew correctly that 'mid-cycle' was the right time to perform BSE and the highest proportion 219 (80.8%), reported incorrectly that the right time for a woman to perform BSE was 'anytime'. However, a greater number of knowledgeable women on BSE practice might influence practice of BSE among women [41].

Breast self-examination (BSE) was the most common breast screening practice among respondents followed by clinical breast examination (CBE) and also BSE still remains the most readily available methods of screening particularly in low resource countries like Tanzania where accessibility, affordability and availability of sophisticated diagnostic screening methods are difficult to access in terms of cost. Akpo et al. (2009) stated that all the participants (100.0%) practice breast self-examination but 50.0% knew how to correctly do breast self-examination [19]. In this study about

31% of respondent women practiced BSE and among those who practice BSE, only 25(26.6%) had regular practice. Among those who don't practice BSE reported main reasons for not practicing BSE were reason for not performing BSE was, to don't know to perform BSE 179(59.7%), Not sure on their ability on detection of early signs of Breast cancer when performing BSE 174 (58%), Fear of positive findings 107(35.7%) and Not interested 44(14.7%). Due to this low level of BSE practice among respondent found in this study, means that majority of women into the community do not practice BSE and this will result late diagnosis of Breast cancer signs and chronic stage of disease among women who were at risk, also increase difficultness in treatment of Breast cancer due to late presentation finally increase morbidity and mortality among women. This is contrast in other studies done in different areas with different populations like Performance of self-breast examination among female health workers remain low and variable in different respondents; like studies done by Oche et al., 2009 and Bello et al., 2011 in Nigeria among nurses 54%, 30%, 13.0% [31,40,42]. had ever carried out BSE. In the studies done among doctors 68% performed BSE. Another study conducted on non-health professionals indicated 95% had ever done BSE [40,33,34]. The only common difference in those studies in terms of knowledge on BSE is posture when doing BSE in which it was reported to be high (more than 50%) compared to this study (28%). The possible reasons for being high in practicing BSE among respondents in different studies compared to this study is because other studies done in more urban areas and cities in which respondents are more exposed to mass media as the main source of information, due to high influence from the society as well as a large group of respondents be literate like those study done among nurses and doctors. But in case of being low, this might be due to other studies to be carried in rural areas compared to this study which carried in urban settings. However, BSE practice might be hindered by several barriers facing women during performing BSE.

Majority of respondent women (more than 50%) reported that, barriers which hinder their practice of BSE for detecting early signs of Breast cancer were Lack of family history of breast cancer so why bother doing it 266(88.7%), Forgetfulness 260(86.7%), Lack of motivation/ influence from the society 219(73%), Lack of Knowledge of performing BSE 179(59.7%) and Lack of Self-confidence 174(58%). Rest of the respondent women (less than 50%) reported that other barriers which hinder their practice of BSE were Fear of finding abnormal mass 107(35.7%), Not at risk 44(14.7%), Lack of time 36(12%), Is not necessary 32(10.7%), Embarrassing behavior 27(9%), Dislike touching Breast 21(7%) and Reluctance to practice BSE 17(5.7%). Due to these barriers found in this study, means without being eliminated and minimized, still majority of women within the society will face difficultness in practicing BSE, finally lead to late diagnosis of the disease, difficult treatment of disease due to its chronicity, morbidity due to several mamodectomy and finally more morbidity among women. The same barriers have been shown in same previous studies done in different populations at different areas in which respondents

reported barriers in performing and practicing BSE were not having a family history of breast cancer Fear of finding a lump, Forgetfulness, ignorance of technique [30,31]. not considering it necessary and feeling of discomfort at touching the breast [33,31]. were other reasons provided for non-performance of BSE. Many studies expressed, most important factor for not doing BSE is lack of knowledge regarding the conduct of BSE, some believed they can never have breast cancer, others felt they were violating their bodies by palpating their breasts while some were scared of being diagnosed with breast cancer [33]. Fewer others factors that hindering performance of BSE were: did not believe in the efficacy of the test, they did not have any symptom/ they did not have any problem with their breasts, while some said they did not have time, forgetfulness, procrastination, laziness, as lack of trust in their ability to perform BSE/ lack of self- confidence to do it, anxiety, and lastly, lack of awareness [33,34, 43-45,6,22-23,40,42, 46,47]. This means removal or minimizing of these barriers which hinder practice of BSE among women will have positive influence in practicing BSE [48,49].

4. Conclusion

This work reveals low level and incomplete awareness, knowledge and practice of BSE accompanied with more barriers hindering BSE practice among women in Moshi municipality, Kilimanjaro region. Educational efforts must be continued and expanded to include awareness, knowledge and practice of BSE toward detecting early signs of breast cancer among women in Moshi municipal, Kilimanjaro region [50-54].

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Author Contributions

Conceived and designed the Whole work: Ridhiwani H. Manyuti and Dr. Adinani Juma . **Performed data Collection from the field:** Ridhiwani H. Manyuti. **Analyzed the data:** Ridhiwani H. Manyuti. **Contributed materials/analysis tools:** Ridhiwani H. Manyuti and Dr. Adinani Juma. **Wrote the paper:** Ridhiwani H. Manyuti and Dr. Adinani Juma.

References

1. Loh, S. Y., & Chew, S. L. (2011). Awareness and practice of breast self examination among Malaysian women with breast cancer. *Asian Pac J Cancer Prev*, 12(1), 199-202.
2. Ferlay, J., Shin, H. R., Bray, F., Forman, D., Mathers, C.,

- & Parkin, D. M. (2010). Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *International journal of cancer*, 127(12), 2893-2917.
3. Bray, F., Ren, J. S., Masuyer, E., & Ferlay, J. (2013). Global estimates of cancer prevalence for 27 sites in the adult population in 2008. *International journal of cancer*, 132(5), 1133-1145.
4. Wilson, C. M., Tobin, S., & Young, R. C. (2004). The exploding worldwide cancer burden. *International Journal of Gynecologic Cancer*, 14(1).
5. Forouzanfar, M. H., Foreman, K. J., Delossantos, A. M., Lozano, R., Lopez, A. D., Murray, C. J., & Naghavi, M. (2011). Breast and cervical cancer in 187 countries between 1980 and 2010: a systematic analysis. *The lancet*, 378(9801), 1461-1484.
6. Morse, E. P., Maegga, B., Joseph, G., & Miesfeldt, S. (2014). Breast cancer knowledge, beliefs, and screening practices among women seeking care at district hospitals in Dar es Salaam, Tanzania. *Breast cancer: basic and clinical research*, 8, BCBCR-S13745.
7. Azubuike, S. O., & Okwuokei, S. O. (2013). Knowledge, attitude and practices of women towards breast cancer in Benin City, Nigeria. *Annals of medical and health sciences research*, 3(2), 155-160.
8. Coughlin, S. S., & Ekwueme, D. U. (2009). Breast cancer as a global health concern. *Cancer epidemiology*, 33(5), 315-318.
9. Elmore, J. G., Armstrong, K., Lehman, C. D., & Fletcher, S. W. (2005). Screening for breast cancer. *Jama*, 293(10), 1245-1256.
10. Ertem, G., & Kocer, A. (2009). Breast self-examination among nurses and midwives in Odemis health district in Turkey. *Indian journal of cancer*, 46(3), 208-213.
11. Harirchi, I., Kolahdoozan, S., Karbakhsh, M., Chegini, N., Mohseni, S. M., Montazeri, A., ... & Ebrahimi, M. (2011). Twenty years of breast cancer in Iran: downstaging without a formal screening program. *Annals of oncology*, 22(1), 93-97.
12. Sadjadi, A., Nouraei, M., Ghorbani, A., Alimohammadian, M., & Malekzadeh, R. (2009). Epidemiology of breast cancer in the Islamic Republic of Iran: first results from a population-based cancer registry. *EMHJ-Eastern Mediterranean Health Journal*, 15 (6), 1426-1431, 2009.
13. World Health Organization. *Breast cancer: prevention and control*. 2013.
14. Sambo, M. N., Idris, S. H., Dahiru, I. L., & Gobir, A. A. (2013). Knowledge and practice of self-breast examination among female undergraduate students in a northern Nigeria university. *Journal of Medicine and Biomedical Research*, 12(2), 62-68.
15. Ginsberg, G. M., Lauer, J. A., Zelle, S., Baeten, S., & Baltussen, R. (2012). Cost effectiveness of strategies to combat breast, cervical, and colorectal cancer in sub-Saharan Africa and South East Asia: mathematical modelling study. *Bmj*, 344.
16. The American Cancer Society. *Breast Cancer Prevention and Early Detection*. 2017.

17. Okobia, M. N., Bunker, C. H., Okonofua, F. E., & Osime, U. (2006). Knowledge, attitude and practice of Nigerian women towards breast cancer: a cross-sectional study. *World journal of surgical oncology*, 4, 1-9.
18. Gueye, S. M., Bawa, K. D., Ba, M. G., Mendes, V., Toure, C. T., & Moreau, J. C. (2009). Breast cancer screening in Dakar: knowledge and practice of breast self examination among a female population in Senegal. *Revue Médicale de Bruxelles*, 30(2), 77-82.
19. Omotara, B., Yahya, S., Amodu, M., & Bimba, J. (2012). Awareness, attitude and practice of rural women regarding breast cancer in Northeast Nigeria. *J Community Med Health Educ*, 2(5), 1-4.
20. Oluwatosin, O. A. (2010). Assessment of women's risk factors for breast cancer and predictors of the practice of breast examination in two rural areas near Ibadan, Nigeria. *Cancer epidemiology*, 34(4), 425-428.
21. Akhigbe, A. O., & Omuemu, V. O. (2009). Knowledge, attitudes and practice of breast cancer screening among female health workers in a Nigerian urban city. *BMC cancer*, 9, 1-9.
22. Ibrahim, N. A., & Odusanya, O. O. (2009). Knowledge of risk factors, beliefs and practices of female healthcare professionals towards breast cancer in a tertiary institution in Lagos, Nigeria. *BMC cancer*, 9(1), 1-8.
23. Anyanwu, S. N. (2008). Temporal trends in breast cancer presentation in the third world. *Journal of Experimental & Clinical Cancer Research*, 27, 1-6.
24. Oluwatosin, O. A., & Oladepo, O. (2006). Knowledge of breast cancer and its early detection measures among rural women in Akinyele Local Government Area, Ibadan, Nigeria. *BMC cancer*, 6, 1-6.
25. Abulhair, O. A., Al Tahan, F. M., Young, S. E., Musaad, S. M., & Jazieh, A. R. M. (2010). The first national public breast cancer screening program in Saudi Arabia. *Annals of Saudi medicine*, 30(5), 350-357.
26. Aderounmu, A. O., Egbewale, B. E., Ojofeitimi, E. O., Fadiora, S. O., Oguntola, A. S., Asekun-Olarinmoye, E. O., ... & Akanbi, O. (2006). Knowledge, attitudes and practices of the educated and non-educated women to cancer of the breast in semi-urban and rural areas of SouthWest, Nigeria. *The Nigerian postgraduate medical journal*, 13(3), 182-188.
27. Parkin, D. M., Bray, F., Ferlay, J., & Pisani, P. (2005). *Global cancer statistics, 2002*. CA: a cancer journal for clinicians, 55(2), 74-108.
28. Akarolo-Anthony, S. N., Ogundiran, T. O., & Adebamowo, C. A. (2010). Emerging breast cancer epidemic: evidence from Africa. *Breast cancer research*, 12, 1-4.
29. Akhigbe, A. O., & Omuemu, V. O. (2009). Knowledge, attitudes and practice of breast cancer screening among female health workers in a Nigerian urban city. *BMC cancer*, 9, 1-9.
30. Akpo, E. E., Akpo, M. O., & Akhator, A. (2010). Breast cancer knowledge and screening practices among Nigerian medical students. *Internet Journal of Health*, 11(2), 1-8.
31. Aniebue, P. N., & Aniebue, U. U. (2008). Awareness of Breast Cancer and Breast Self Examination Among Female Secondary School Teachers in Enugu Metropolis, South Eastern Nigeria. *International Journal of Medicine and Health Development*, 13(2), 105-110.
32. Balogun, M. O., & Owoaje, E. T. (2005). Knowledge and practice of breast self-examination among female traders in Ibadan, Nigeria. *Annals of Ibadan Postgraduate Medicine*, 3(2), 52-56.
33. Bassey, R. B., Irurhe, N. K., Olowoyeye, O. A., Adeyomoye, A. A., & Onajole, A. T. (2010). Knowledge, Attitude and Practice of breast self-examination among nursing students in the Lagos University Teaching Hospital.
34. Burgess, C. C., Linsell, L., Kapari, M., Omar, L., Michell, M., Whelehan, P., ... & Ramirez, A. J. (2009). Promoting early presentation of breast cancer by older women: a preliminary evaluation of a one-to-one health professional-delivered intervention. *Journal of psychosomatic research*, 67(5), 377-387.
35. Beydağ, K. D., & Yürügen, B. (2010). The effect of breast self-examination (BSE) education given to midwifery students on their knowledge and attitudes. *Asian Pac J Cancer Prev*, 11(6), 1761-1764.
36. Donmez, Y. C., Dolgun, E., & Yavuz, M. (2012). Breast self-examination practices and the effect of a planned training program in western turkey. *Asian Pacific Journal of Cancer Prevention*, 13(12), 6159-6161.
37. Gursoy, A. A., Hindistan, S., Nural, N., Kahriman, I., Yilmaz, F., Yigitbas, Ç., ... & Mumcu, H. K. (2009). Comparison of three educational interventions on breast self-examination knowledge and health beliefs. *Asian Pac J Cancer Prev*, 10(5), 765-772.
38. Hussein, D. M., Alorf, H., Al-Sogaih, Y., Alorf, S., Alaskar, R., Al-Mahana, A., ... & Hindawi, S. (2013). Breast cancer awareness and breast self-examination in Northern Saudi Arabia. *Saudi Med J*, 34(7), 681-688.
39. Inoue, M., Pickard, J. G., Welch-Saleeby, P., & Johnson, S. (2009). African-American caregivers' breast health behavior. *Health Education Research*, 24(5), 735-747.
40. Agboola, A. O. J., Deji-Agboola, A. M., Oritogun, K. S., Musa, A. A., Oyebadejo, T. Y., & Ayoade, B. A. (2009). Knowledge, attitude and practice of breast self examination in female health workers in Olabisi Onabanjo university teaching hospital, Sagamu, Nigeria. *IIUM Medical Journal Malaysia*, 8(1).
41. Oladimeji, K. E., Tsoka-Gwegweni, J. M., Igbodekwe, F. C., Twomey, M., Akolo, C., Balarabe, H. S., ... & Oladimeji, O. (2015). Knowledge and beliefs of breast self-examination and breast cancer among market women in Ibadan, South West, Nigeria. *PloS one*, 10(11), e0140904.
42. Agwu, U. M., Ajaero, E. P., Ezenwelu, C. N., Agbo, C. J., & Ejikeme, B. N. (2007). Knowledge, attitude and practice of breast self examination among nurses in Ebonyi State University Teaching Hospital Abakaliki. *Ebonyi Medical Journal*, 6(1).

43. Oluwole, O. C. (2008). Awareness, knowledge and practice of breast-self examination amongst female health workers in a Nigerian community. *Sudan Journal of Medical Sciences*, 3(2), 99-104.
44. Ogunbode, A. M., Fatiregun, A. A., & Ogunbode, O. O. (2015). Breast self-examination practices in Nigerian women attending a tertiary outpatient clinic. *Indian journal of cancer*, 52(4), 520-524.
45. Özaras, G., Durualp, E., Civelek, F. E., Gül, B., & Ünsal, M. (2010). Analysis of breast selfexamination training efficiency in women between 20–60 years of age in Turkey. *Asian Pac J Cancer Prev*, 11(3), 799-802.
46. Ahuja, S., & Chakrabarti, N. (2009). To determine the level of knowledge regarding breast cancer and to increase awareness about breast cancer screening practices among a group of women in a tertiary care hospital in Mumbai, India. *Internet J Public Heal*, 1(1), 1-19.
47. Ajayi, I. O., Onibokun, A. C., & Soyannwo, O. A. (2013). Breast and cervical cancers awareness and screening practices among rural women in Ona-Ara local government area, Ibadan, Nigeria. *African Journal of Biomedical Research*, 16(2), 95-99.
48. Faronbi, J. O., & Abolade, J. (2012). Breast self examination practices among female secondary school teachers in a rural community in Oyo State, Nigeria.
49. Adesunkanmi, A. R. K., Lawal, O. O., Adelusola, K. A., & Durosimi, M. A. (2006). The severity, outcome and challenges of breast cancer in Nigeria. *The breast*, 15(3), 399-409.
50. Sambanje, M. N., & Mafuvadze, B. (2012). Breast cancer knowledge and awareness among university students in Angola. *Pan African Medical Journal*, 11(1).
51. Makanjuola, O. J., Amoo, P. O., Ajibade, B. L., & Makinde, O. Y. (2013). Breast cancer: knowledge and practice of breast self examination among women in rural community of Ondo State, Nigeria. *IOSR J Pharm Biol Sci*, 8(1), 32-7.
52. Malak, A. T., Bektash, M., Turgay, A. S., Tuna, A., & Genc, R. E. (2009). Effects of peer education, social support and self esteem on breast self examination performance and knowledge level. *Asian Pac J Cancer Prev*, 10(4), 605-8.
53. Ebrahim, S. (2014). Knowledge of students toward breast cancer and breast self-examination practice at high school nursing in Basra city. *Rev J Kufa for Nurs Sci*, 4(1), 0-0.
54. Tahmasebi, R., & Noroozi, A. (2011). Factors influencing breast cancer screening behavior among Iranian women. *Asian Pacific journal of cancer prevention: APJCP*, 12(5), 1239-1244.

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