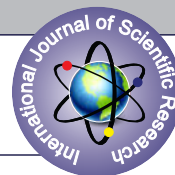


EFFECTIVENESS OF AN EDUCATIONAL PROGRAM ABOUT BREAST CANCER AND BREAST CANCER SELF-EXAMINATION ON PERCEPTION AND PRACTICE AMONG WOMEN IN ALJEERAIF WEST ADMINISTRATIVE UNIT (2)



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ABSTRACT

In Sudan, cancer incidence has been growing considerably in recent years and is likely to continue to grow creating a big burden on the health system resources.

The aim of this study is to assess the baseline Perception and Practice about breast cancer and breast self-examination (BSE) and to find out the effectiveness of an educational program about breast cancer and BSE on Perception and Practice among women in AlJeeraif West Administrative Unit.

Community based intervention study with pre-post and control was carried out among 200 women who were recruited by means of multistage sampling. The sample size was divided equally into intervention and control groups. Baseline data was collected from both groups through direct interview, using structured close ended questionnaire.

Educational program was implemented for the intervention group. Four months after the intervention, women in the study and control groups were exposed to the same questionnaire. Chi-square, paired t-test and independent t-test (difference of difference) were conducted in the course of the data analyses. There was statistically significant difference in the intervention group pre-post program in all of the HBM components in the intervention group (p value 0.000), while in the control group statistically significant difference existed only in perceived barrier (p value 0.004) and perceived benefit (p value 0.000) and over all perception (p value 0.016) with no significant difference in other (HBM) components. In the intervention group practice and performance scores were highly significant pre-post program (p value 0.000), where as in the control group only practice was significant (p value 0.001). There were statistically significant differences in the mean difference of performance, practice and perceptions between the intervention and control groups (p-value 0.000).

The results of this study have confirmed the effectiveness of educational program based on the health belief model on improving perceptions and practice of breast cancer and breast self-examination.

KEYWORDS

Breast cancer, breast self-examination, health education, Perception and Practice, AlJeeraif West.

INTRODUCTION:

Breast cancer is the second most common of all cancers in the world and among women, with an estimated 1.67 million new cases diagnosed in 2012 (25% of all cancers) (Ferlay et al, 2015). There is a rising incidence of breast cancer, both in the developed and developing countries.

Worldwide over 1.5 million women are diagnosed with breast cancer and 502,000 die from the disease each year (Ghaffari et al, 2014). The incidence of breast cancer in African countries (reported to be 23 per 100,000) is lower than overall rates in North America or Western Europe, as well as lower than rates among black women residing in these Western countries.

Local registries in Africa reported a doubling of rates over the past 40 years (Porter et al, 2008). Incidence rates were higher in more developed countries compared to less developed countries (71.7/100,000 and 29.3/100,000 respectively, adjusted to the World 2000 Standard Population) whereas the corresponding mortality rates were 17.1/100,000 and 11.8/100,000, with the differential linked to a combination of early detection, access to treatment services and cultural barriers (Youlden et al, 2012). Breast cancer survival rates vary greatly worldwide, ranging from 80% or more in developed countries to less than 40% in low-income countries (Alsharabatti et al, 2013). In low and middle-income countries Breast cancer has a low cure rate because patients often present with late-stage disease with other organs metastases (Abuidris et al, 2013). Poor outcomes in low- and middle-income countries may be due to the inefficiency of healthcare systems in successful early detection, diagnosis and treatment of breast cancer

(Ozmen et al, 2008). Most patients with breast cancer in the region present for the first time at stages two and three, indicating the need for increased community awareness and early detection of the disease (Organization et al, 2006). Early detection is the identification of breast cancer at a stage where the possibility of treatment and survival rate is greatest. It remains the principal strategy and helps to decrease mortality and morbidity from breast cancer (Yip et al, 2008). Public awareness and education in BSE can have great impact on early identification, diagnosis, treatment and consequently survival from breast cancer.

In Sudan, cancer incidence has been increasing at an average yearly rate of 0.061 over the last five decades 1967–2010 and is likely to continue rising (Elamin et al, 2015). The data from National Cancer Registry (NCR) indicated that breast cancer is the most common cancer with an incidence rate of 25.1 per 100,000 (Saeed et al, 2014).

In many countries, cancer is considered as a social stigma that prevents people from seeking medical care. In Sudan, there is a common belief that cancer is infectious, leading to isolation of patients and breakdown of marriages, which makes patients hesitant to seek medical care. Due to lack of awareness about the signs and symptoms of cancer many people do not present to medical care until they have very advanced disease.

A total of 78% of Sudanese patients have stage III or IV disease when they first seek medical treatment (Hamad et al, 2006). In these stages, treatment may often involve multiple modalities, including surgery, radiotherapy, chemotherapy and hormone therapy, and has a markedly

diminished chance of success. Therefore, there is an urgent need for better early detection of cancer in Sudan to make treatment more effective, not expensive, need minor surgery, and access to treatment services and acceptable to patients.

The Health Belief Model (HBM):

The HBM was originally developed as a systematic method to explain and anticipate preventive health behavior. It focused on the relationship of health behaviors, practices and utilization of health services.

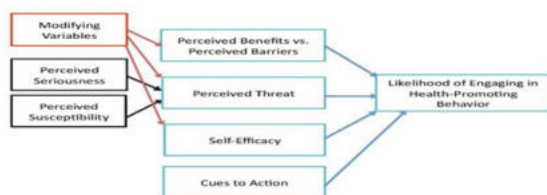
Health Belief Model is one of the most widely used conceptual frameworks, which is often used in designing educational programs and in testing knowledge, perception and practice of individuals regarding their health (Akhtan-Zavare et al,2016). It has been used in many countries in studies of breast cancer and BSE and in Sudan it has been used in studies about HIV/AIDS.

The model specifies that health-related behavior is influenced by a person's perception of the threat caused by a health problem and by the benefits associated with a person's action to reduce that threat (Dundar et al,2006).

The HBM has been widely used to examine perceptions related to breast cancer screening behaviors, such as BSE, clinical breast examination (CBE), and mammography (Aghamolaei et al,2011). Based on the HBM, a woman who perceives that she is susceptible to breast cancer and that breast cancer is a serious disease would be more likely to practice regular breast examinations. Similarly, a woman who perceives more benefits from and fewer barriers to BSE would be more likely to practice BSE. A woman who has an internal cue (body perception) or who has been exposed to an external cue (e.g., the positive influence of a health care provider or the media) would also more likely practice BSE, also, the model assessed perceived self-efficacy that reflects the perception of individuals about their abilities to perform BSE correctly (Dundar et al,2006).

Many investigators studying beliefs related to breast cancer screening practices have used HBM as a theoretical framework to study breast cancer screening behavior such as BSE or mammography screening in Iran (Aghamolaei et al,2011), Kingdom of Saudi Arabia, Turkey (Gursoy et al,2009) and Hong Kong (Yan yy et al,2009). Malaysia (Akhtan-Zavare et al,2016).

The Health Belief Model



Components of the model are:

Perceived susceptibility, perceived severity, perceived benefits, Perceived barriers, cue to action and Self-efficacy.

PROBLEM STATEMENT:

Breast cancer is the commonest cancer among women in Sudan. It accounts for 16.12% of all cancers (30.24% of all female cancers in 2006 (Ahmed h et al,2010). It occurs at a younger age compared to Western Women, as about 40% of the patients are below the age of 45 years and mean age of 50 years. Most of the patients present with stages 3 and 4 (Ahmed h et al 2013).

Breast cancer mortality is high in Sudan and most patients are detected at late stages of the disease, due to the lack of awareness and absence of screening programs (Norman p et al,2005).

RATIONALE:

Lack of knowledge and wrong beliefs regarding the importance of regular BSE could have an effect on not to perform BSE. Education programs could improve the behaviors of individuals regarding BSE, thus designing suitable educational interventions could promote this screening healthy behavior among women (16)

Public awareness and education in BSE can have great impact on early

identification, diagnosis, treatment and consequently survival from breast cancer (Ahmed h et al,2013).

METHODS

Study Design

This is a community-based intervention study pre intervention-post intervention education program with control.

Study Area:

The study was conducted in Al-Jeeraif West administrative unit; it is one of the old Administrative units of Khartoum Locality, it is located in east Khartoum and divided into six Haras. Its population is about (44800), consists of many tribes and foreigners. Al Shaheed Abu Dojana is one of health centers there providing health services.

Study Population:

Women aged (20-65) resident in Al-Jeeraif West.

Inclusion Criteria:

Women aged 20-65 years, who were available at the time of study and accepted to participate in the study.

Exclusion Criteria:

- Women whom we found difficulty to communicate with (deaf, with severe mental illness, etc)
- Severely ill patients.
- Women who had history of breast cancer
- Non-Sudanese women resident in El-Jeeraif West

Sampling:

Sampling Technique:

Multistage sampling technique

Sample size:

The sample size was calculated Using this formula: -

$$n = \frac{((z1 - \alpha/2) \sqrt{2p(1-p)}) + z1 - \beta \sqrt{p1(1-p1) + p2(1-p2)}}{(A)^2}$$

Where:

n=sample size

P=.5

Z 1- $\alpha/2$ = area of 95% under the normal curve = 1.96

Z 1- $\beta/2$ = the power of 80% = .84

Proportions were estimated from a previous study conducted in Gezira State, in which, 12% of women adhered to practicing BSE prior to education intervention regarding breast cancer and 33% post intervention (abdurahman sa et al,2006).

P1=the pre knowledge from previous study = .12

P2= the post knowledge test .33.

$\Delta = P1 - P2 =$

Thus, the sample size was 100 women for the study group and another 100 for the control group. The sample size was distributed to the two haras in study group by using probability proportion to size, the households and women were chosen by the same way as for the control group.

Sampling Technique:

Regarding the study group a total of two (Haras) were selected by using the computer probability proportion to size (PPS), and each Haras was consisted of number of households proportional to the percentage of households in hara. The first household was selected using random computer table; the subsequent houses were selected according to the interval which was calculated to be 20.

If the data collectors found more than one woman fulfilled the inclusion criteria in the selected house, he will select one randomly, and if there was no woman in the selected house or no woman fulfilled the inclusion criteria, he will move to the next house and so on. The control was from 5th and 6th Haras in El-Jeeraif West administration unit, which were far away and more or less similar to the study group. The households and women were chosen by the same way as for the study group.

Data Collection Tools And Techniques

Data was collected through direct interview using structured closed ended questionnaire. The duration of data collection was two weeks before intervention and two weeks after it.

Data Management And Analysis

Data collected was cleaned in the field for consistency and completeness by researcher. It was coded, tabulated and analyzed by statistician using computer package with the software: SPSS version 20.

The data obtained by questionnaire was analyzed based on the set of objectives of the study using descriptive and inferential statistics.

Descriptive statistics, such as percentages, frequencies, means, and standard deviations, were used to measure the socio- demographic variables and the responses to knowledge.

The knowledge was measured using multiple choice questions and one correct answer. Each item regarding the knowledge was scored one when correctly answered and others as zero. Analytical statistics such as paired test, t-test and chi-square test were used to determine pre-post intervention change in knowledge about breast cancer and BSE. Independent t-test (difference of difference) was used to compare the mean difference between the intervention and control groups pre-post program. Statistical significance was <0.05 for all analyses.

Ethical Consideration:

Ethical approval was obtained from Sudan Medical Specialization Board (SMSB) and Khartoum State Ministry of Health (KSMOH).

Informed consent was taken before any subject was enrolled in the study. The participants were informed about the aim and potential benefit of the study, the voluntary nature of their participation and their right to access the research findings before giving verbal consent. They have the full autonomy and freedom to change their minds and withdraw at any time, without giving a reason. All the participants were informed that this survey is completely anonymous, the name, or any other identity information will not be used for any purpose other than this study.

The privacy and confidentiality of the data was ensured.

RESULTS**Response Rate:**

All participants, both in the control and intervention areas responded to the study pre and post to the intervention, thus giving a response rate of 100%.

Socio-demographic characteristics of respondents:

Table 1 show that almost all participants were distributed to the four age groups. Majority of them 44.7% had university education, 60.5% were unemployed, 67.5% having family monthly income of (1000-1500) Sudanese Pond (SDG). No statistically significant differences existed between the intervention and control groups with regard to socio-demographic variables, except for the family monthly income (P-value 0.004).

Table (1): Distribution Of Study Sample According To Socio-demographic Characteristics Inaljeeraif West Administrative Unit, 2017 (n=200)

socio-demographic characteristics		Women			P-value
		Control group	Intervention group	Total	
		N(%)	N(%)	N(%)	
Age	20_29	24(24)	27(27.3)	51(25.6)	0.477
	30_39	27(27)	23(23.2)	50(25.1)	
	40_49	21(21)	28(28.3)	49(24.6)	
	50_60	28(28)	22(21.2)	50(24.7)	
	Total	100(100)	100(100)	200(100)	
Education level	Basic	18(18)	19(19)	37(18.5)	0.189
	Secondary	28(28)	39(39)	67(33.5)	
	University	54(54)	42(42)	96(48)	
	Total	100(100)	100(100)	200(100)	
Employment	House wife	57(57)	64(64)	121(60.5)	0.079
	Student	14(14)	15(15)	29(14.5)	
	Employee	28(28)	15(15)	43(21.5)	
	Free business	1(1)	3(3)	4(2)	

	Retired	0(0)	0(0)	0(0)	
	other (mention)	0(0)	3(3)	3(1.5)	
	Total	100(100)	100(100)	200(100)	
Family monthly income in SDG	Less than 1000	7(7)	26(26)	33(16.2)	0.004
	1000-1500	76(76)	58(58)	134(67.5)	
	1500-3000	16(16)	14(14)	30(14.7)	
	More than 3000	1(1)	2(2)	3(1.5)	
	Total	100(100)	100(100)	200(100)	

Perceptions:

Table2.change In Perceptions (susceptibility, Seriousness, Barriers, Benefits, Motivation, Confidence) Among Study Sample, Atal-jeeraifwest Administrative Unit, 2017 (n=200)

Perceptions	Control group			Intervention group		
	Mean	Std. Deviation	P_value	Mean	Std. Deviation	P_value
Perceive_susceptibility_pre	43.2667	8.13715	.017	45.6333	16.61402	0.000
Perceive_susceptibility_post	42.1000	9.15823		67.0000	9.89847	
Perceive_Seriousness_pre	75.9500	7.86390	.273	72.6000	12.91933	0.000
Perceive_Seriousness_post	74.8000	11.96945		77.0500	8.58249	
Perceive_Barriers_pre	60.6286	10.13274	.004	69.0000	15.23471	0.000
Perceive_Barriers_post	58.1143	11.80631		84.3714	12.63120	
Perceive_benefits_pre	73.5714	7.59059	.000	82.8857	13.59966	0.001
Perceive_benefits_post	68.4571	10.25681		88.6571	9.13000	
Perceive_Motivation_pre	81.5143	8.28731	.978	83.3714	11.81441	0.000
Perceive_Motivation_post	81.5429	11.32289		96.2286	8.42961	
Perceive_Confidence_pre	49.1091	11.63055	.205	48.8364	20.49886	0.000
Perceive_Confidence_post	48.4000	12.90000		71.8182	14.87124	
Overall_Perceptions_pre	63.4217	5.50158	.016	66.0565	8.35345	0.000
Overall_Perceptions post	61.7435	8.09273		80.2870	7.06417	

Table2. indicate that statistically significant difference exists in the intervention group pre-post program in all of the HBM components in the intervention group (p value0.000), while in the control group statistically significant difference exist only unperceived barrier (p value.004) and perceived benefit (p value.000) and over all perception (p value.016) with no significant difference in other HBM components.

Practice**Table.3 Change In Practice And Performance Scores Among Study Sample, At Aljeeraif West Administrative Unit, 2017 (n=200)**

Practice	Control group			Intervention group		
	Mean	Std. Deviation	P_value	Mean	Std. Deviation	P_value
Practice pre	11.3333	18.48347	.001	17.6667	24.82486	0.000
practice post	17.0000	29.01101		51.6667	25.67823	
Perform ance pre	15.8333	21.27066	.887	19.4167	26.08625	0.000
Perform ance post	15.9167	22.19364		63.9167	23.95560	

Table3. shows that in the intervention group practice and performance scores were highly significant pre-post program (p value 0.000), where as in the control group only practice was significant (p value 0.001).

Table4. Mean Difference In Performance, Practice And Perceptions Among Study Sample, At Aljeeraifwest Administrative Unit (n=200), 2017

Intervention VS control	N	Mean	Std. Deviation	P-value
performance_diff	Control	100	.0100	.70345
	Intervention	100	5.3400	
practice_diff	Control	100	.1700	.51355
	Intervention	100	1.0200	
susceptibility_diff	Control	100	-.3500	1.44512
	Intervention	100	6.4100	
Seriousnes_diff	Control	100	-.4600	4.16920
	Intervention	100	1.7800	
Barriers_diff	Control	100	-.8800	2.97898
	Intervention	100	5.3800	
benefits_diff	Control	100	-1.7900	3.53423
	Intervention	100	2.0200	
Motivation_diff	Control	100	.0100	3.61673
	Intervention	100	4.5000	
Confidence_diff	Control	100	-.3900	3.05801
	Intervention	100	12.6400	
Perceptions_diff	Control	100	-3.8600	15.82481
	Intervention	100	32.7300	

Table.4. shows that statistically significant difference exist in the mean difference of performance, practice and perceptions between the intervention and control groups (p-value .000).

DISCUSSION:

Public awareness and education in BSE can have great impact on early identification, diagnosis, treatment and consequently survival from breast cancer (Ahmed h et al,2013).

The aim of this study is to assess the baseline Perceptions and Practice about breast cancer and breast self-examination and to find out the effectiveness of an educational program about breast cancer and BSE on Perceptions and Practice.

The current study intervention involved training of women how to perform BSE in correct technique, our results revealed improvement in BSE practice and performance in the intervention group post intervention, the mean difference in practice and performance between the intervention and control group was significantly different. This shows that the breast health awareness program successfully motivated the women towards BSE practice and performance. Similar findings of previous studies reported that intervention program significantly increased both BSE practice and accuracy among intervention group Among Korean-America women (Lee c. et al,2011), in Iran (Farma kkf et al,2014), Malaysia (Hajin s et al,2011) and Turkey (Karayurki et al,2009).

In the control group there was improvement in BSE, this result may again be due to the power of the questions which sensitized women to change their practice. Further, the cost-free nature of BSE may also attract women to practice this preventive action. While there was no statistically significant difference between pre-program and post

program. In these performance in the control group and this can be explained by the fact that women do not have the skills of how to perform the BSE and do not know the instructions of doing this preventive intervention. Lack of accuracy in performing BSE would reduce the competence of early lump detection. Thus, it is crucial to demonstrate the techniques of BSE.

This program was done with help of expert volunteer women from (Mubadarat Innovation Group). Their role in raising awareness about breast cancer and BSE among the women in Al-Jeeraif West Administrative Unit is highly appreciated. Thus, using volunteer women may be effective strategy for raising women awareness.

The response rate of the participation both in the intervention and control areas was 100% and also the participation of the women in the intervention area in the education session was full for the whole five days. This indicates that the women are highly enthusiastic and motivated to participate in issues concerning their health specially in regarding cancers. The study revealed that there was no significant difference between the intervention and control groups in most socio-demographic-characteristics. This finding ensures the similarity of the intervention and control groups.

In this study, women's perceptions regarding breast cancer and BSE screening behavior were significantly increased after health education in all of the HBM components (susceptibility, seriousness, barriers, benefits, motivation, confidence) in the intervention group, also the mean difference in perceptions between the intervention and control group was significantly different. This result shows that the health education intervention was effective in terms of increasing accurate perceptions and this is consistent with previous studies conducted among Korean-American women (Lee c. et al,2011), and in Iran (Aghamolaei et al,2011), Zahedan city in Iran (Farma kkf et al,2014). In the control group there is statistically significant difference in perceived susceptibility, perceived barrier, perceived benefit and overall perception with no obvious significant difference in seriousness, motivation and confidence. This change in some of the perception's components may be explained by the effect of the questions on the women perceptions, the so called the power of questions, this finding is consistent with previous study in Iran (Hajian s et al,2011).

BSE is considered as one of the most important public health strategies in the early detection of BC. Women should be informed about the BSE, which is one the most important steps in adopting the protective health behaviors, Breast self-examination is one way for woman to know how their breasts normally feel and can help to empower women to take some control and responsibility over their health. Teaching BSE and issues about breast cancer as early as possible will go a long way to encourage positive behavior towards BSE, create a breast-awareness and can lead to seeking regular CBE. The results of this study demonstrated the effectiveness of education program based on the health belief model, in promoting BSE behavior. It significantly increased perceived susceptibility to breast cancer and cleared the seriousness of breast cancer. Furthermore, this program decreases perceived barriers to breast self-examination and cleared its benefit, increased perceived self-efficacy to perform BSE and improved practice of this screening method. Moreover, the comparative analyses of the two groups of this study showed effectiveness of the intervention in improving perception, practice and performance of BSE in intervention group compared to those in control group. These results are inconsistency with many previous studies conducted worldwide.

CONCLUSION:

High response rate throughout the study indicates that women were cooperative and interested in issues related to their health.

This study has confirmed the effectiveness of educational program based on HBM in promotion of perceptions about breast cancer and BSE and about BSE practice.

Health education proved to be an effective tool for raising awareness about BSE and detecting breast changes. This was obvious in the study as about 5% of the women in the intervention group detected breast problem which were confirmed by the surgeon participating in the training to be real changes, and they continue follow up with the same surgeon.

Federal and states ministries of health should implement programs for

BSE. Regular follow up of the same study participants for longer time to identify the effect of time on retention of positive behavior and practice of the participants is needed. More researches with larger and more diverse samples based on HBM are needed to get a better understanding of women perception, and practice regarding BSE.

Conflict Of Interest: authors do not have any conflict of interest.

Data Availability:

You have requested to statement the availability of data and the reason if not available:

All that you have mentioned are true concerning the availability of data.

This manuscript is a part of my college thesis for fulfilling a Medical doctorate in community medicine in Sudan board in 2017. I have contacted her about the data, unfortunately, it is not available because as she gave the questionnaire to a statistician who entered the data and analyzed and he had sent the results without data.

Also, she contacts him after your request but he mentioned that 3 years is too long to keep it.

The results of all thesis and the thesis itself and the questionnaire all are available and readers can access them by contacting the first author Dr.Amel Elagib (amel409@gmail.com).

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