ORIGINAL ARTICLE

Public Health and Preventive Medicine Archive (*PHPMA*) 2018, Volume 6, Number 1: 37-41
E-ISSN: 2503-2356

The determinants of early breast cancer detection via breast self-examination (BSE) in Denpasar, Bali

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ABSTRACT

Background and purpose: Breast cancer is the leading cause of death in females, followed by colorectal cancer. Early detection of breast cancer can be done through breast self-examination (BSE). BSE behaviour is influenced by an individual's level of knowledge and perceptions of the procedure. This study examines the determinants of BSE behaviour in married women aged 15-49 in six villages in the working area of Puskesmas (public health centre) II in West Denpasar, Bali, Indonesia.

Methods: A cross-sectional survey was employed with 180 respondents selected by multistage random sampling. Data were collected using standardised questionnaire carried out from November-December 2016. Multiple poisson regression was used to identify the determinants of the BSE behaviours.

Results: The proportion of respondents who performed BSE in the three months prior to interview is 55.6%, and, of these, 50.0% reported performing BSE regularly. Multivariate analysis shows the significant determinants of BSE are: high-school and above (APR=2.03; 95%CI:1.41 to 2.92); having a good knowledge of BSE (APR=1.41; 95%CI:1.09 to 1.82); perceived benefits (APR=2, 24; 95%CI:1.53-3.29); perceived low barrier (APR=1.63; 95%CI: 1.16-2.29); and high self-efficacy (APR=1.50;95%CI:1.16-1.95).

Conclusions: Level of education, good knowledge of BSE, perceived benefits, perceived low barriers, and high level of self-efficacy are the significant determinants of BSE practice. These findings suggest that education on BSE should be enhanced, particularly for women with lower levels of education.

Keywords: Breast cancer, breast self-examination (BSE), Bali

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INTRODUCTION

Breast-cancer is the most common cancer in women, affecting 43.1 women per 100,000 in 2012.[1] The second, third, and fourth most common cancers are colorectal, cervical and lung cancers.[1]

In 2013, Indonesian Basic Health Research (Riskesdas) showed that the prevalence of all cancers in Indonesia was 1.4 per 1000 population, with Bali ranked third (2 per 1000), after Yogyakarta (4.1 per 1000), and Central Java (2.1 per 1000).[2]

A 2014 report from the Bali Provincial Health Office showed that the total number of breast cancer cases in Bali was 192 cases per annum, with most cases (42%) occurring in women aged 20-44.[3]

Early detection of breast cancer is vital in order to improve survival rates.[4] An estimated 95% of women diagnosed and treated for breast cancer at an early stage can survive for more than five years after diagnosis and mortality can be reduced by 25-30%.[4] Breast self-examination (BSE) is a simple, cost-effective, and easy-to-perform method of detecting breast cancer.[5] The Indonesian Government's BSE program has been running since 2008 and includes health initiatives such as counselling and promoting the importance of BSE, however, the proportion of women of reproductive age performing BSE remains low at 46% in 2016.[6] This finding is supported by the results of a study carried out at Sanglah Hospital, Bali, which indicated that most (68%) breast cancer patients first present with advanced stages of the disease.[7] Such delays in seeking treatment are caused by several factors: patient's lack of knowledge about cancer and BSE, fear of a cancer diagnosis, economic factors and health insurance issues, belief in the efficacy of herbal medicine, lack of exposure to information about cancer, the level of support given by patient's husband and/or family, as well as the lack of effective BSE in women to aid the early detection of breast cancer.[8,9]

Previous study shows that effective BSE behaviour is influenced by several factors: individual's knowledge of breast cancer and BSE, family history of cancer, as well as the fear of cancer itself.[10,11] BSE behaviour is also influenced by an individual's perceptions of BSE. For example, studies from Indonesia and Iran show a significant

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relationship between BSE's perceived benefits, the perceived barriers to performing BSE, and individual's level of self-efficacy, with the effective adoption of BSE.[12,13] In addition to individual's perceptions, effective BSE behaviour is also influenced by women's skill level at performing BSE.[14]

The present study aims to identify the proportion and determinants of BSE practice among married women aged 15-49.

METHODS

A cross-sectional survey was employed in November-December 2016 with 180 married women aged 15-49 selected by multistage rando m sampling. Three villages were selected randomly from the six villages in the Puskesmas II West Denpasar's working area. Eleven out of 23 hamlets (banjar) then randomly selected in the three selected villages. Finally, 180 respondents were selected by systematic random sampling from the list of married women aged 15-49 in these 11 banjar.

The questionnaire used in this study was pre-tested on 15 women with similar characteris-tics to this study's respondents. The questions onthe perception-related variables were adapted fromthe questionnaire used in the Champion's Health Belief Model Scale (CHBMS).[15] The researchers, assisted by six enumerators (who were trained prior to the interviews), carried out the data collection. Each respondent was provided with a verbal explanation of the study's aim and informed consent was requested in writing prior to each interview.

The dependent variable examined in this study is the reported practice of BSE over the past three months, while the independent variables consist of age, education, family history of breast cancer, knowledge of cancer, knowledge of the signs and symptoms of breast cancer and its prevention, perceived susceptibility to breast cancer, perceived seriousness of breast cancer, perceived benefits of BSE, perceived barriers to adopt BSE, and self-efficacy. The data were analysed using STATA SE 12.1 and multiple poisson regression to determine the factors associated with BSE practice. This study has obtained ethical approval from the Ethics Committee Faculty of Medicine, Udayana University/Sanglah General Hospital on 27th October 2016.

Table 1 Characteristics of respondents and BSE practices

Characteristics	n	%
Age (years)		
<35	57	31.67
≥35	123	68.33
Education		
≤Junior high school	59	32.78
≥High school	121	67.22
Family history of cancer		
Yes	15	8.33
No	165	91.67
Performing BSE in the last three months		
No	80	44.44
Yes	100	55.56
BSE frequency in the last three months (n=100)		
Once	24	24.00
Twice	26	26.00
3 times	33	33.00
4 times	2	2.00
5 times	1	1.00
6 times	10	10.00
8 times	4	4.00
Reasons for irregular BSE (n=71)		
No motivation	16	8.89
Consider BSE as unimportant	3	1.67
BSE not required because no symptoms	23	12.78
Other	29	16.11
Knowledge of BSE (n=100)		
Know how to perform BSE	40	40.00
Do not know how to perform BSE	60	60.00
Total	180	100.00

RESULTS

Table 1 shows the characteristics of the respondents and the proportion of BSE practice in the three-month period prior to interview. Most respondents (68.3%) aged >35 with the mean of age was 37.6 years; 67.2% had high-school education or above, and 91.7% had no family history of breast cancer. The number of respondents who reported practicing BSE in the last three months prior to interview was 100 (55.6%) but within this group, only 50 (50.0 %) reported performing regular BSE during the past three months. Out of 100 respondents who reported ever practicing BSE in the last three months, the average frequency was 2.8 times (Table 3), with 24% had performed BSE once, 26% twice, 33% three times, and 17% four times or more.

Table 2 shows the association between BSE practices in the 3-month period prior to interview and some independent variables. There were significant associations between BSE practices with education ($p<0.001$), knowledge of BSE ($p<0.001$), perceived benefits of BSE ($p<0.001$), perceived barriers to

Table 2 Proportion of BSE practices by independent variables

Characteristics (n = 180)	Performing BSE		p value
	No n (%)	Yes n (%)	
Age (years)			
< 35	27(47.37)	30(52.63)	
≥ 35	53(43.09)	70(56.91)	0.591
Education			
≤ Junior high school	38(64.41)	21(35.59)	
≥ High school	42(34.17)	79(65.29)	<0.001
Family history of cancer			
No	75(45.45)	90(54.55)	
Yes	5(33.33)	10(66.67)	0.366
Knowledge of BSE			
Poor	73(55.73)	58(44.27)	
Good	7(14.29)	42(85.71)	<0.001
Perceived seriousness			
Less serious	68(47.89)	74(52.11)	
Feel serious	12(31.58)	26(68.42)	0.072
Perceived vulnerability			
Less vulnerable	78(44.83)	96(55.17)	
Feel vulnerable	2(33.33)	4(66.67)	0.577
Perceived benefits			
Less useful	53(70.67)	22(29.33)	
Feel useful	27(25.71)	78(74.29)	<0.001
Perceived barriers to BSE			
There are barriers	39(67.24)	19(32.76)	
No barrier	41(33.61)	81(66.39)	<0.001
Self-efficacy			
Low	69(58.47)	49(41.53)	
High	11(17.74)	51(82.26)	<0.001
Total	80(44.44)	100(55.56)	

BSE (p<0.001), and self-efficacy (p<0.001). There were no significant associations identified between BSE practices and age (p=0.591), family history of cancer (p=0.366), perceived seriousness of breast cancer (p=0.072), and perceived susceptibility to breast cancer (p=0.577).

Table 3 shows the average frequency of BSE among the 100 respondents who reported performing BSE in the three months prior to interview by the independent variables. There were significant mean differences of BSE frequency by education (p=0.001), knowledge of BSE (p=0.001), perceived benefits of BSE (p=0.002), perceived barriers to BSE (p<0,001), and self-efficacy (p=0.031). These findings were consistent to those in the association of BSE practice with the independent variables shown in Table 2.

Table 4 shows significant associations between BSE practices with education of high-school or above (APR=2.03;95%CI:1.41-2.92), good knowledge of BSE (APR=1.41;95%CI: 1.09-1,82), perceived benefits of BSE (APR =2.24;95%CI:1.53-3.29), perceived low barri- ers to BSE (APR=1.63;95%CI:1.16-2.29), and high self-efficacy (APR=1.50; 95%CI:1.16-1.95).

DISCUSSION

The proportion of respondents who reported performing BSE in the last three months prior to interview was 55.56%. Among all respondents (n=180), 50(27.8%) reported practicing BSE three times or more in the past three months. This means that only 27.8% of respondents performed BSE once per month as recommended.[16] The reasons of respondents who reported performing BSE irregularly were lack of motivation and perceiving BSE as unimportant because of an absence of symptoms. This study also reveals that of the 100 respondents who reported performing BSE, only 40.0% practicing BSE with the recommended procedure.

Studies conducted in West Kalimantan and Central Java found that the proportions of respondents who reported performing BSE were 53.3%[17] and 52.3%[12] respectively, although no time frames were mentioned. Therefore, the findings of the present study that show a higher uptake of BSE in Denpasar compared to West Kalimantan and Central Java could potentially because of the three months time period used as the time frame. The current study indicates the proportion of respondents who reported performing BSE routinely was 27.8%. This finding was higher than the result of a study carried out in Banteran, Central Java, which found that only 17.2% of respondents reported performing BSE on a routine basis, while 33.3% admitted performing BSE occasionally.[18]

This study found that respondent's education is a determinant associated with BSE practice (APR=2.03;95%CI:1.41-2.92). This finding is consistent with the results of studies in Klaten[10] and Central Java,[12] which also reported that education is one of the determinants of effective BSE practice.

Furthermore, the present study also shows that good knowledge is an important factor of BSE practices (APR=1.41;95% CI: 1.09-1.82). This suggests that respondents with a good knowledge of breast cancer and its prevention are likely to perform BSE more frequently. The results of this study are consistent with other studies in West Kalimantan[17] and South Kalimantan[19] that also indicated a significant relationship between BSE uptake and knowledge. Meanwhile, other studies in Tanah Karo, North Sumatra[20] and Turkey,[21] also suggested an

Table 3 Mean differences of BSE frequencies by independent variables

Characteristics (n=100)	Mean BSE frequency	p value
Age (years)		
<35	2.33	
≥35	3.00	0.326
Education		
≤ Junior high school	1.76	
≥ High school	3.08	0.0011
Family history of cancer		
No	2.76	
Yes	3.20	0.270
Knowledge of BSE		
Poor	2.47	
Good	3.26	0.001
Perceived seriousness		
Less serious	2.84	
Feel serious	2.69	0.946
Perceived vulnerability		
Less vulnerable	2.77	
Feel vulnerable	3.50	0 .812
Perceived benefits of BSE		
Less useful	1.82	
Feel useful	3.08	0.002
Perceived barriers		
There are barriers	2.21	
No barriers	2.94	<0.001
Self- efficacy		
Low	2.45	
High	3.14	0.031
Average frequency of BSE (in general)	2.8	

Table 4 Adjusted PR of determinants of BSE

Variables	Adjusted PR	95% CI	p value
Education ≥ high school	2.03	1.41-2.92	<0.001
Good knowledge of BSE	1.41	1.09-1.82	0.009
Perceived benefits of BSE	2.24	1.53-3.29	<0.001
Perceived low barriers to BSE	1.63	1.16-2.29	0.005
High self-efficacy	1.50	1.16-1.95	0.002

association between knowledge on early detection of breast cancer and BSE.

This study suggests that the perceived benefits of BSE, perceived low barrier to BSE, and high self-efficacy are significant determinants of BSE practices. Respondents with perceived benefits of BSE, low barrier to BSE, and high self-efficacy tend to perform BSE routinely. These results are consistent with those of an Iranian study showing that perceived benefits of BSE and high self-efficacy are determinants of regular BSE.[13]

The present study indicates no significant association between BSE and family history of cancer. This finding is not consistent with the results of a study in South Kalimantan[19] that suggested a significant association between family history of cancer and regular BSE. These different findings may be because only a very small proportion (8.33%) of respondents in our study have a family history of breast cancer, while 45% of respondents in the South Kalimantan study reported family history of breast cancer.

Refer to the Health Belief Model,[22,23] effective BSE practice is found to be significantly associated with perceived benefit, perceived barriers, and self-efficacy. However, BSE appears not to be associated with respondent's perceived seriousness and perceived susceptibility to breast cancer. This may be due to the weakness of the instrument used to measure these perceptions, as reported in a similar study in Hong Kong.[24] Another limitation of this study is the limited area being covered, thus the generalization of the findings should be taken with caution.

CONCLUSION

The proportion of married women aged 15-49 who reported performing BSE is 55.56%; meanwhile, the proportion of those who report performing BSE regularly in the three months prior to interview is 27.8%. The variables determining the adoption of regular BSE are: education level, knowledge of breast cancer and its early detection, perceived benefits, perceived low barrier to BSE and high self-efficacy. The findings of this study reinforce the need for more widespread BSE campaigns combined with educational approaches to inform women about the risks of breast cancer and the importance of BSE; increasing their knowledge of BSE and promoting positive perceptions towards it.

ACKNOWLEDGEMENT

We would like to thank the Head of Public Health Center (Puskesmas) II, West Denpasar, the Heads of Dauh Puri Kelod Village, Dauh Puri Kangin Village and Dauh Puri Kauh Village, and all respondents who participated in this study.

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