Knowledge and Beliefs about Breast Cancer Screening among Nurses and Midwives: A Cross-sectional Study

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Abstract

Aim: Breast cancer is the most common type of cancer in Iranian women. Clinical nurses and midwives are supposed to be at high risk of the disease. The present study aimed at comparing the knowledge and health beliefs of Iranian nurses and midwives about breast cancer screening using Health Belief Model (HBM).

Methods: In this cross-sectional study, 100 nurses and 60 midwives working in teaching hospitals affiliated to Shahid Sadoughi University of Medical Sciences (Yazd, Iran) were selected via convenience sampling. Three questionnaires were used to collect data including a demographic questionnaire, the Breast Cancer Knowledge Test, and Champion's Revised Health Belief Model Scale. Data were analyzed using SPSS-11.0 for Windows.

Findings: According to the independent t-test results, the mean knowledge scores of the two groups were significantly different ($p<0.05$). There was no significant difference in mean health belief scores between the two groups ($p>0.05$). Spearman's rank correlation coefficient revealed a significant direct correlation between knowledge and health beliefs in both nurses and midwives ($P=0.018$; $r=0.18$). The same test suggested knowledge to have significant direct correlation with benefits of mammography ($P=0.01$; $r=0.2$), benefits of breast self-awareness ($P<0.001$; $r=0.4$), cues to action ($P=0.001$; $r=0.2$), and self-efficacy ($P<0.001$; $r=0.3$).

Conclusion: There are some risk factors including unhealthy life-style behaviours, exposure to night light, and consequently, disruption in circadian rhythm, and that job stress can threaten the health of nurses and midwives. Thus, it is important to determine their perceived barriers of screening behaviours based on HBM.

Keywords: Nurses, Midwives, Health Belief Model, Breast cancer screening, Breast self-examination

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Introduction

Cancer is the second leading cause of death after cardiovascular diseases (CVDs) in the developed countries, and the third in the developing countries. Although cancer deaths are predicted to reach 13.1 million by 2030, nearly 40% of these events can be prevented through risk factor management. Disease burden can, in fact, be reduced by one-third with timely diagnosis and treatment [1]. The WHO has declared the rising incidence of breast cancer, especially in the developing countries. Considering that absence of timely diagnostic programs will lead to diagnosis of the disease at its late stages, and thus reduce survival rates. While cancer is generally prevalent in Iran, breast cancer is still the most common type of cancer in Iranian women. Among all cancers, breast cancer had the highest age specific rate (28.25%) in all provinces of Iran in 2009. Moreover, the disease had the second greatest age specific rate in Yazd Province (38.52%) after Isfahan. Thus, establishment of national cancer prevention and control programs is currently a health requirement in all communities, and it is considered as the most effective factor in reducing the incidence and burden of cancer [2]. Genetic factors, pregnancy at older age, menopause after 55 years of age, and history of endometrial and ovarian cancers are major risk factors for breast cancer [3]. Other risk factors of the disease include exposure to environmental factors. For instance, working night shifts causes disruption to the circadian rhythm, and prevents normal nocturnal secretion of melatonin by the pineal gland, which, in turn, increases oestrogen synthesis by the ovaries in women, and may finally multiply the risk of breast cancer. Despite the suggested relationship between breast cancer risk and working night shifts, further research on the subjects is still warranted [4]. Hansen (2001) emphasized on the necessity of exploring the relationships between exposure to light at night, shift working, and cancers associated with melatonin levels [5]. The International Agency for Research on Cancer (IARC) has identified shift working, particularly rotating night shifts, as a potential cause of cancer in humans [6]. In a cohort study with 10 years of follow-up, Schernhammer et al. (2001) found that women working a minimum of three night shifts per month seemed to be more at risk of breast cancer [7]. Another study introduced working night shifts (from 7 p.m. to 9 a.m.) to increase breast cancer risk by 60% [8].

Apparently, since nurses and midwives working in clinical settings are supposed to be at high risk of breast cancer, their knowledge and practice about screening behaviours such as breast self-examination, clinical examination by a specialist, mammography, and life-style modification have

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to be improved. A study in Norway reported nurses to be at higher risk of breast cancer compared to women in the general population, and supported the relationship between working night shifts and breast cancer risk in women [9]. However, women's late visits to the physician is responsible for most of the mortality and adverse outcomes associated with breast cancer in Iran [10]. Montazeri et al. (2003) stated that 70% of Iranian women die following the late diagnosis of breast cancer [11]. Grunfeld et al. (2003) identified negative attitude toward seeking medical help, low perceived behavioural control, and negative beliefs about breast cancer outcomes (e.g. disability and deformity) as the main reasons for women's late visits. They reported a three-six-month delay from the onset of symptoms to treatment to be linked with low survival rate [12]. Thomas et al. (2011) found that most women lacked a proper understanding of breast cancer risk, and did not actively participate in breast cancer screening. They also suggested the absence of any incentive (due to fear and denial of the disease) as other factor affecting women's breast cancer screening behaviours [13].

The present study was conducted to determine the knowledge and beliefs of nurses and midwives about breast cancer screening. The findings of this study have seldom been reported as a part of previous research found in the literature. It is hoped that the findings of this study could be beneficial in identifying potential areas for improvement when designing educational strategies in cancer prevention. It is believed that the results can be useful in the design and implementation of educational programs based on health models in order to motivate women to seek breast cancer diagnosis and treatment at early stages.

Methods

This cross-sectional study assessed the health knowledge and beliefs of Iranian nurses and midwives working in teaching hospitals affiliated to Shahid Sadooghi University of Medical Sciences (Yazd, Iran) in 2014. Convenience sampling was applied to select 100 nurses and 60 midwives from the Gynaecology ward, Delivery room, and other wards of the mentioned hospitals. After reiterating the voluntary nature of participation and confidentiality of the data, the researchers distributed self-report questionnaires among the subjects. Three distinct questionnaires were used to collect data. The first one was a demographic questionnaire contained age, profession (nurse/midwife), marital status, education level, employment status (project, permanent, or fixed term), work experience, shift type, mean number of night shifts per month, and history of cancer (breast, ovarian, uterine cancers, and lymphoma). The second questionnaire was the Breast Cancer

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Knowledge Test (McCane, 1990) comprising 19 multiple-choice items. The respondents should select the true answer. The third questionnaire was Champion's Revised Health Belief Model Scale (CRHBMS, 1999), which includes the constructs of HBM, i.e. self-efficacy (11 items), motivation/cue to action (seven items), perceived susceptibility (five items), perceived severity (seven items), perceived benefits of breast self-examination (six items), perceived barriers to breast self-examination (six items), perceived benefits of mammography (five items), and perceived barriers to mammography (11 items). The items of this scale were scored based on a five-point Likert scale (from totally disagree to totally agree).

Before data collection, the Breast Cancer Knowledge Test and CHRBMS were translated into Farsi (Persian) and back-translated into English by two English language experts. For face validity, backward and forward translation of the original questionnaire was conducted by the expert's opinions. First, the original English questionnaire was translated into Persian by two independent experts, and then compared with two Persian translations. The translators were sometimes consulted with to determine the best and most agreed upon Persian sentences in the questionnaire. In the second step, which was reverse translation, this Persian version was translated into English by another expert who did not see the original text of the questionnaire. Therefore, comparison of the translated English questionnaire with the original version was conducted to assess the conceptual sameness of the questionnaire. In the third step, the translated questionnaire in the second step was translated to Persian language, and the final Persian version of the questionnaire was prepared after consulting with expert translators and the research team.

In order to evaluate the reliability of the questionnaires, they were issued to 30 participants, and Cronbach's alpha was calculated as 0.7-0.9 for all the dimensions of the questionnaire and 0.91 for the whole questionnaire. Previous studies have reported similar results [14, 15].

In order to score the questionnaires, 38 points were allocated to knowledge items (one and two points for incorrect and correct answers, respectively). The subjects were then categorized as having poor, moderate, and favourable knowledge (scores 19-24, 25-31, and 32-38, respectively). Items related to barriers to breast self-examination and barriers to mammography were reverse scored. The scores of HBM constructs lay in the range of 11-55, 7-35, 5-25, 7-35, 6-30, 6-30, 5-35, 11-55 for self-efficacy, cue to action, susceptibility, severity, benefits of breast self-examination, barriers to breast self-

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examination, benefits of mammography, and barriers to mammography, respectively.

Data were analyzed using descriptive statistics (frequency tables) and inferential statistics (independent t-test, Chi-square test, and Spearman's rank correlation coefficient) in SPSS-11.0 for Windows. P-values less than 0.05 were regarded as significant.

Results

The studied nurses and midwives were similar in terms of demographic characteristics (Table 1). The mean knowledge scores were 31.41 ± 2.72 and 32.25 ± 2.66 among the nurses and midwives, respectively. According to two-sample independent t-test results, the mean knowledge scores of the two groups were significantly different (Table 2). Both nurses and midwives possessed the poorest level of knowledge regarding the frequency and timing of breast self-examination and mammography during the reproductive age and menopause, effects of screening methods on the chance of breast cancer treatment, correct breast self-examination technique, abnormal symptoms (e.g. nipple discharge), and breast cancer risk factors (Table 3). Independent t-test showed no significant differences in mean health belief scores between the nurses and midwives. However, the two groups had significant differences in the mean scores of self-efficacy and perceived severity (Table 4).

Table 1: Demographic characteristics of the study sample

Variable / Group ▸		Nurses (n=100)	Midwives (n=60)
Age		33.64±6.92 Range: 22-48y	34.25±7.97 Range:22-54y
Work experience (years)		10.55±7.17	11.42±7.42
Marital status	**Never married**	20 (20%)	15 (25%)
	Married	80 (80%)	45 (75%)
Education qualifications	**Nursing/Midwifery diploma**	2 (2%)	3 (5%)
	University degree	98 (98%)	57 (95%)
Employment status	**Project**	40 (40%)	26 (43.33%)
	Fixed	60 (60%)	34 (56.66%)
Work-shift type	**Rotating**	78 (78%)	41 (68.3%)
	Morning	18 (18%)	12 (20%)
	Evening	2 (2%)	3 (5%)
	Night	2 (2%)	4 (6.7%)
Mean number of night shifts per month		8±2	8±2
Family history of cancer	**Breast**	15 (15%)	6 (10%)
	Uterine	1 (1%)	-
	Lymphoma	1 (1%)	-
	Ovarian	-	-

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Table 2: Comparison of the knowledge level of nurses & midwives about breast self-examination and mammography

Group ▸ / Level	Nurses N(%)	Midwives N(%)	t	Sig
Favourable	1(1%)	36(60%)	1.902	0.04
Moderate	49(49%)	24(40%)		
Poor	50(50%)	-		
M±SD	31.41±2.72	32.25±2.66		

Table 3: Comparison of breast cancer knowledge in nurses & midwives

Item	% Correct	
	Nurses	Midwives
BSE should be performed how often (*Once a month)	63%	70%
Most breast lumps found by whom (*Women themselves)	81%	81%
How much difference regular BSE screening makes in chance of cure (*A great deal)	62%	58%
BSE is effective method of cancer detection (* True)	88%	88.3%
Mammography can detect unfelt lumps (*True)	91%	78.3%
Beginning age for BSE (*20)	42%	70%
Mammography cancels out BSE & CBE (*False)	64%	78.3%
Current mammography recommendations (*False)	43%	41.7%
Using palm of hands is effective (*False)	15%	35%
BSE should be done during menstrual cycle (*False)	44%	56.7%
Looking in mirror is part of good BSE (*True)	89%	85%
Looking at breasts is not necessary in BSE (*False)	63%	66.7%
Nipple discharge is normal (*False)	62%	73.3%
Feeling underarm is part of good BSE (*True)	78%	78.3%
Squeezing of nipple is part of good BSE (*True)	66%	68.3%
Frequency of BSE if postmenopausal (*Once a month)	41%	66.7%
Palpating the breast with pads or tips of fingers (*Pads of fingers)	77%	73.3%
Examples of abnormal breast changes (*All (discharge, lump or thickening, & dimpling of skin))	87%	88.3%
Breast cancer risk increases with age (*True)	85%	66.7%
M±SD	31.41±2.72	32.25±2.66

Table 4: Comparison of the health beliefs of nurses & midwives

Constructs	Score range	Nurses M±SD	Mean percent of maximum point	Midwives M±SD	Mean percent of maximum point	t	Sig
*Confidence (self-efficacy)	11-55	34.89±6.15	63.43	37.20±6.31	67.63	-2.276	.024
Health motivation (cues to action)	7-35	26.16±4.31	74.74	26.18±4.84	74.80	-.032	.097
Perceived susceptibility	5-25	12.06±4.61	48.24	10.91±4.51	46.64	1.529	.128
*Perceived severity	7-35	23.7±4.63	67.71	20.95±5.02	59.85	3.573	.000
Benefits (Breast self-exam)	6-30	21.24±3.89	70.80	21.25±4.64	70.83	-.015	.988
Barriers (Breast self-exam)	6-30	21.34±4.5	71.13	22.06±5.10	73.53	.931	.353
Benefits (Mammography)	5-35	16.46±3.26	47.02	15.40±3.76	44.00	1.876	.062
Barriers (Mammography)	11-55	32.73±7.64	59.50	30.95±7.08	56.27	1.497	.136

The weak points of nurses and midwives in health beliefs included failure to distinguish between normal and abnormal breast tissues, failure to find abnormal masses in the breast, unhealthy life-style (e.g. sedentary lifestyle and consumption of cancer-causing foods),

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low perceived susceptibility and severity, fear of thinking about cancer, destroyed marital relationships in case of developing breast cancer, and high levels of perceived barriers to breast self-examination and mammography. Spearman's rank correlation coefficient revealed a significant, direct correlation between the knowledge and health beliefs in both nurses and midwives. In other words, subjects with higher knowledge had more positive attitudes toward breast cancer screening behaviours (P=0.018; r=0.18). The same test suggested knowledge to have significant, direct correlations with benefits of mammography (P=0.01; r=0.2), benefits of BSE (P<0.001; r=0.4), cues to action (P=0.001; r=0.2), and self-efficacy (P<0.001; r=0.3). Chi-square test indicated that demographic characteristics were not significantly related with either level of knowledge or health beliefs in the nurses and midwives.

Discussion

The present study investigated the knowledge and health beliefs of nurses and midwives working in teaching hospitals of Yazd (Iran) about breast self-examination and mammography. Since few similar studies in Iran have focused on nurses and midwives, our findings could not be widely compared with those of other research. According to our findings, the nurses had poor to moderate knowledge, and their mean knowledge score was significantly lower than that of the midwives. This difference can be justified by the fact that nurses attend internal and surgery wards more than midwives do; thus, they tend to take part in relevant training courses less often.

On the other hand, both nurses and midwives had poor knowledge about the appropriate time and technique of breast self-examination and frequency of mammography at different ages. Olumuyiwa et al. showed that although nurses had favourable level of knowledge regarding the symptoms and diagnostic methods of breast cancer, they had relatively poor knowledge about the suitable time and technique of breast self-examination [16]. Carelli (2008) found that while the majority of female patients, doctors, medical students, and midwives had desirable levels of knowledge about breast self-examination, they did not perform it correctly. He argued that since breast self-examination is a critical measure in countries with limited resources, women have to be provided with adequate and accurate information about breast health through promoted awareness campaigns [17].

Mammography and clinical breast examination are highly valuable in initial diagnosis of breast cancer. In other words, though these techniques are not effective alone, they can raise women's

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awareness of cancer and lead them toward visiting a physician for early diagnosis. Many women with breast cancer have, in fact, visited doctors after detecting a lump in their own breasts [2]. In a study by Avci et al. (2008), 78.6% of the included midwives had participated in a breast self-examination in-service training course, but 75.7% of them did not feel confident enough to teach others [18]. Akpinar et al. (2011) reported low levels of knowledge and practice of breast self-examination, mammography, and clinical breast examination in nurses and midwives. They concluded that since health care team members act as role models for other women, their knowledge, attitude, and practice can seriously affect breast cancer control and should, hence, be improved through in-service training [19]. Gozum and Aydin (2004) indicated that as breast self-examination taught by a physician, nurse, or a midwife will be performed effectively, training courses for nurses and midwives are required to improve their knowledge [20]. Accordingly, it is necessary to encourage nurses and midwives to participate in breast health-seeking educational courses. In the current study, the nurses and midwives did not have a significant difference in the mean health belief scores. Meanwhile, both groups scored above average in self-efficacy dimension, and the midwives had higher levels of self-efficacy and confidence in correctly performing breast self-examination. Both groups stated that they could notice abnormal changes in their own breasts when they looked in the mirror, but finding different sizes of lumps (large or small) was hard for them. Moreover, both nurses and midwives reported differentiating between normal and abnormal breasts to be difficult. Cavdar (2007) found low self-efficacy and inability to distinguish between normal and abnormal breasts as the main reasons for avoiding breast self-examination [21]. Therefore, health personnel who teach breast self-examination to women have to consider their health beliefs [18].

More than half of the nurses and midwives in the present study did not have regular weekly physical activity. Since unhealthy life-style behaviours, such as sedentary life-style, are among the breast cancer risk factors [22], not only exposure to night light and disrupted circadian rhythm, but also inactivity threatens the health of nurses and midwives. Besides, more than half of our participants reported lack of regular medical check-ups. In a content analysis, Vedadhir et al. (2008) evaluated women's health from the viewpoint of health journals in Iran, and concluded that 51% of the studied articles were related to pregnancy and postnatal care, malnutrition, and cancers in women. They believed that the medical community has largely neglected women's health and well-being in their research

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activities. They further discussed that women's multiple roles along with dependence on their husbands and fathers (in some cases, they can only visit a doctor in the presence of their husband or father) can delay or inhibit their treatment and jeopardize their health [23].

We found perceived susceptibility of the nurses and midwives to breast cancer to be low, i.e. the attitudes of most participants made them feel immune to cancer and deny their risk of affliction. In addition, fear of thinking about breast cancer and damage to marital relationships in case of having breast cancer were among the barriers to paying due attention to breast health that is in line with the results from other studies. For example: in a study in Turkey, Hasihasanoglu (2008) detected fear of being threatened and blamed by the spouse and friends, lack of time, forgetting monthly breast self-examinations, and fear of finding a lump as the most important barriers to breast self-examination, and thus emphasized on the necessity of educational programs [24]. Guilford (2011) found that university women had a low level of perceived susceptibility to breast cancer. Furthermore, self-efficacy and perceived barriers were indicated to significantly predict breast self-examination [25]. In a study by Ohene-Yeboah (2013), only 44.8% of the questioned nurses considered themselves at risk of breast cancer [26].

The present study revealed significant direct correlations between knowledge and some constructs of the HBM (e.g. perceived benefits, perceived severity, cue to action, and self-efficacy). Canbulat and Uzun (2008) recognized positive health beliefs as the predictors of performing breast self-examination in female physicians, nurses, and midwives. Moreover, in women who performed breast self-examination, perceived susceptibility, cue to action, benefits of breast self-examination, and self-efficacy were significantly higher than others [27].

Both nurses and midwives in the current study believed in the benefits of breast self-examination and mammography as two useful methods in early diagnosis of breast cancer. Haji-Mahmoodi et al. (2002) reported that 70% of the participating women possessed the necessary knowledge for breast self-examination, and strongly believed in its benefits. However, only 6% of them regularly performed breast self-examination [28]. Nevertheless, the majority of our participants had no specific plans for breast self-examination or mammography despite their belief in the usefulness of screening methods. Ertem and Kocer (2009) [29] published similar results. Moodi et al. (2012) clarified the lower rate of mammography in Iran as compared to the developed countries, and underscored the necessity of identifying factors affecting

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screening behaviours (particularly mammography) among Iranian women and eliminating the barriers [30]. In a study by Venkatramana et al. (2011), although 52.6% of the participating nurses strongly believed that women over 40 years of age should perform mammography, only 39% underwent regular annual mammography [31].

Perceived barriers to mammography from the standpoint of nurses and midwives in the current research were unfamiliarity with the process, the procedure being time-consuming, costly and painful, behaviour of mammography personnel with the patients, and unnecessary exposure to radiation. On the other hand, breast self-examination may evoke feelings of shyness, shame, and discomfort. Oche et al. (2012) detected high levels of knowledge about mammography and its application in early diagnosis of breast cancer among 84% of physicians and nurses. Nevertheless, merely 32% of the mentioned subjects were familiar with the method of mammography. Moreover, although 57% of the participating women showed a positive attitude toward mammography, and suggested it to other women, only 9% had actually experienced it as they mostly assumed themselves not being at risk of breast cancer [32]. Avci contended that Muslim women regard their breasts as private parts of their bodies and form defensive and protective thoughts about them. Consequently, they deem screening behaviours to be painful, disturbing, and shameful procedures. Furthermore, their belief in destiny and God's will affects their perceived susceptibility to and severity of breast cancer [33]. Therefore, cultural factors have to be born in mind when planning educational interventions.

Based on our findings, there was a significant relationship between knowledge and health beliefs in the nurses and midwives. In other words, those with higher knowledge had more positive attitudes. Since people's knowledge directly affects their attitudes, this finding seems absolutely normal. Kashfi et al. reported comparable results in 2012 [34]. Fayazi et al. (2013) investigated the knowledge, attitude, and practice of female medical students. They noticed favourable, moderate, and poor levels of knowledge in 43.9%, 42.2%, and 13.9% of the participants, respectively. They also established a significant relationship between the students' knowledge and attitudes, i.e. those with higher levels of knowledge had more positive attitudes [35]. Since few similar studies in Iran have focused on nurses and midwives, our findings could not be widely compared with those of other research. Furthermore, women's cultural beliefs and their psychological status at the time of completing the questionnaires could have somewhat affected their responses.

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Conclusion

It is noteworthy that we applied the health belief model (HBM) as an analytical framework for assessment of the knowledge and health beliefs of nurses and midwives. This model can be recommended for designing continuous educational programs to promote the health of clinical nurses and midwives. This turns more important knowing the substantial effects of nurses and midwives on the attitudes of other women and promotion of screening behaviours.

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