RESEARCH COMMUNICATION

Predictors of Mammography Screening among Iranian Women Attending Outpatient Clinics in Tehran, Iran

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Abstract

   Mammography utilization is low in Iran compared with other countries. Here a cross-sectional survey design was used to investigate psycho-social and individual factors associated with mammography among 400 women asymptomatic of breast cancer. The study was carried out at the four outpatient clinics of Tehran during the period from July through October, 2009. We found that mammography screening was related to higher self-efficacy and women's occupation. Future tailored interventions on potential psycho-social determinants and specific demographic factors are critical in increasing mammography screening rates among Iranian women.

Keywords: Breast cancer screening - mammography - psycho-social factors - demographic factors - Iran

Introduction

   Among women, the most frequent form of cancer is breast cancer, which has accounted for 548,000 deaths worldwide in 2007 (WHO, 2008). For Iranian women, breast cancer is one of the most important, growing issues (Montazeri, 2003). The incidence of breast cancer in Iranian women is around 22 per 100,000 (Mousavi, et al., 2007). Fewer than one out of five Iranian women with breast cancer, however, are diagnosed in the early stage (Mousavi, et al., 2007) compared with three out of five American women (American Cancer Society, 2008). Additionally, breast cancer influences Iranian women at least one decade younger than their counterparts in developed countries (Harirchi, 2000).

   Less is identified about psychosocial and demographic predictors affecting mammography screening behaviors among Iranian women. Presently, the importance of national health promotion is being underlined, and therefore, understanding these factors will allow the development of measures to improve the rate of mammography utilization.

   To focus on this gap in the literature, we merged three theoretical perspectives such as the Health Belief Model (Hock baum, 1958; Rosentock, 1966), the Theory of Reasoned Action (Fishben & Ajzen, 1975), and the Social Cognitive Theory (Bandura, 1977) based on previous literature with the aim of understanding the significant factors affecting women's participation in mammography. Additionally, certain socio–demographic information such as age, education level, marital status, occupational status, income, and insurance status were applied in the development of the questionnaire. Our study aim therefore, was to explore predictors of mammography use

in women aged 35 and older attending outpatient clinics in Tehran, Iran.

   The identification of specific psychosocial and demographic factors related to obtain a mammogram provides health care professionals with new information for future successful interventions to facilitate breast cancer early detection among Iranian women. The results of this study can be utilized for developing a population based breast screening program to succeed in Iran. The term of mammography screening/use or mammography utilization in this study refers to mammography uptake.

Materials and Methods

Study Design

   This study employed a cross sectional survey design to explore predictive factors that affect mammography adherence among Iranian women attending outpatient clinics. This study took place in Tehran, Iran between July 2009 and October 2009. The data were gathered using questionnaires and administered face to face interviews by well-trained data collectors.

Study Sample

   The data for this study consisted of 400 women aged 35-69 years who were asymptomatic of breast cancer and they were selected using a multistage cluster random sampling procedure from hospitals affiliated to Tehran University of Medical Sciences in Tehran, Iran. Those respondents, which were recognized through a pre-interview having breast cancer or disease in any kind, were excluded from the study. Women were categorized depending on the mammography adherence or non-adherence in the past two years into two groups. The participant group consisted

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of women who had a mammogram in the last two years and the non-participant group of women had never had a mammogram or for whom it had been over 2 years since their last mammogram.

Questionnaire and Measurement

The development of the questionnaire was based on a literature review. Most of the questions for the instrument were gained and modified from previous literatures which had illustrated high reliability. A set of questionnaires was translated by three health care professionals fluent in both English and Persian. Back-translation of the instrument preserved the content validity of the items.

After designing the questionnaire, a pilot study was conducted to ensure its applicability by the intended respondents. That process ideally concerned administering the questionnaire to a small group of individuals from the planned target group and then getting feedback on the questions wording accuracy from the respondents. The modified instrument revised for content, and face validity by an expert panel, which comprised three social scientists with a specialty in community development, two specialized doctors in surgery, an oncologist, a radiologist with specialty in breast cancer diagnosis, two family medicine physicians, two epidemiologist, a professor with a specialty in public health.

The pilot testing evaluated other attributes such as precision (reliability) and accuracy (validity). Reliability testing was conducted on a convenience sample of 31 women aged 35 or above. Based on the reliability alpha, the instrument revealed the Cronbach's alpha values in the pilot study and actual study as more than 0.70. More details of the psychometric assets of the scale have been recently published elsewhere (Ahmadian et al., 2010).

The questionnaire consists of four sections: socio-demographic characteristics, mammography screening behavior, knowledge regarding mammography use, and psychosocial constructs such as self-efficacy, belief, social influence, and barriers.

Socio-demographic characteristics: The aspect comprises age, education level, marital status, occupational status, income, and insurance status.

Mammography screening behavior: This is about mammography utilization (the dependent variable) that was evaluated depending on the mammography adherence or non- adherence in the last two years by asking whether women had ever had a mammogram (yes/no).

Knowledge regarding mammography: Knowledge items were measured using an ordinal scale ("yes"=1 "no and I don't know"=0). The instrument included a total of five knowledge items regarding mammography. The respondent's scores ranged from 0 to 5 with higher score indicating greater knowledge.

Self-efficacy: was evaluated using a five-item scale asking about the women's confidence in the ability to participate in a mammography. The scores ranged from 5 to 25 with higher scores indicating greater confidence in doing mammography.

Barriers: were assessed using a 15-item scale asking about the obstacles which discourage women from participating in mammography such as attitudinal and logistic barriers. The scores ranged from 15 to 75 with higher scores indicating more barriers in doing mammography.

Beliefs: were measured using a 10-item scale asking about women's belief regarding results of mammography utilization. This belief can evaluate how positive or negative the attribute of mammography is. The scores ranged from 10 to 50 with higher scores indicating higher or greater belief which has a positive meaning regarding mammography utilization.

Social influences: were evaluated using a 5-item scale asking about the influence from referent individuals such as doctor, nurse, family members, and friends' opinion, media and others in the medical community which approve or disapprove of doing mammography in women. The scores ranged from 5 to 25 with higher scores indicating higher influence from referent individuals in doing mammography. Self-efficacy, barriers, beliefs, and social influences were measured on a 5 point Likert scale from 1 to 5 (1="Strongly disagree" 2="Disagree" 3="Moderate" 4="Agree "5="Strongly agree").

Data collection

Approval to conduct the survey was provided by the Cancer Institute (CRCI) in Iran. Letters permitting data collections at the participating hospitals were procured prior to the survey. Before collecting data, written approvals were procured from the supervisors of nursing departments of four hospitals.

Trained data collectors executed the face to face interview with women who were in the waiting area of the gynaecology outpatient clinics. Data collectors explained the aim of the study to the participants before data collection process and ensured that the responses were properly understood, by replicating or rephrasing the questions. They were consistent in the way of asking questions, and interacted with the respondents very well.

Data analysis

Data analysis was carried out using the Statistical Package for Social Sciences (SPSS 13). An alpha level of 0.05 was utilized to determine the statistical significance for all analyses. Preliminary exploratory data analysis was carried out to evaluate for missing values, detect outliers, and check for normality. Descriptive statistics described the demographic characteristics. Bivariate analyses were conducted using chi-square, and independent t-tests. Chi-square test was used to recognize significant association between mammography use and demographic factors. The factor analysis using varimax rotation, were used to explore the factor structure of the psychosocial variables. In other words, uni-dimensionality of the scale was established by factor analysis. T-test was used to determine significant differences in the mean scores between the two groups (adherent and non-adherent women) for knowledge, barriers, self-efficacy, beliefs, and social influences.

Binary logistic regression using the enter method was employed to identify odds-ratio of significant variables between two groups that affect women's adherence to mammography screening. Adherence to mammography

was a binary dependent variable in this research. The logistic Regression results appeared as odds ratios (ORs) and 95% confidence intervals, which provided the foundation for evaluating the amount of the differences in independent variables such as socio-demographic factors, knowledge, self-efficacy, beliefs, social influences, and barriers among adherent and non-adherent women. The presence of mammography behavior was coded as "1" for adherence and "0"for non-adherence behavior. An odds ratio was studied as a factor to explain the effects of the predictor's variables in the study. The Wald statistic was used to assess the significance of individual predictors in the logistic model.

Results

Table 1 shows the demographic characteristics of women to compare women adherent to mammography with non-adherents. Women who had undergone mammogram test in the past two years were evaluated as participants (21.5%) and those who had not experienced a mammogram or for whom it had been done over 2 years since their last mammogram, were classified as a non-participant group (78.5%).

The largest number of women in the adherent group was in the age range of 41 to 45 years (40.7%) while, the largest proportion of the women in the non-adherent group was older than 51 years (35.4%). The result also showed approximately 68.5% of the adherent (n=59) and non-adherent group (n=215) were married and most women in the adherent group were university graduates (70.9%) whereas most women in the non-adherent group only achieved primary and secondary school education.

With respect to occupation, almost 67.5% women who have experienced a mammogram test in the last two years, were full time employees, while, the largest proportion of women in non-adherent group were unemployed or housewives (53.2%) and their level of education is limited to primary and secondary school with age ranging more than fifty years old. Most women in both groups had middle income. The results illustrated that the adherent group with 81.4% and the non-adherent with 55.1% were the largest groups.

The Chi-square (χ2) test showed that there is a significant relationship between age (P=0.001), education (P=0.001), marital status (P<0.01), occupation (P=0.001), and income (P=0.001), and insurance (P=0.001) with mammography uptake among 400 respondents. Results showed that the educated and married women with full time occupation, aged ranging from 41 to 45 years were able to improve their health behavior towards mammography.

Bivariate Analysis

Consistent with the model, in bivariate analysis, mammography utilization in Iranian women was significantly related to more knowledge, higher self-efficacy, more positive belief, and lower barriers (P<0.001). The results also revealed that there was a significant difference in social influence between adherent and non-adherent groups [t (180.91) = -4.97, p=.000].

Table 1. Demographic Characteristics of the Respondents (n=400)

	Non-adherent Group n=314(78.5%)		Adherent Group n=86(21.5%)			
	n	%	n	%	χ2	P
Age*						
<40	76	24.2%	20	23.3%		
41-45	69	22.0%	35	40.7%		
46-50	58	18.4%	23	26.7%	26.81	.001
>51	111	35.4%	8	9.3%		
Education*						
Primary	124	39.5%	4	4.7%		
Diploma	69	22.0%	11	12.8%		
Graduate	81	25.8%	61	70.9%	67.26	.001
Postgraduate	40	12.7%	10	11.6%		
Marital**						
Married	215	68.5%	59	68.6%		
Widow	69	22.0%	10	11.6%	9.65	.008
Single	30	9.5%	17	19.8%		
Occupation*						
Full time Employee	89	28.3%	58	67.4%		
Part Time Employee	58	18.5%	14	16.3%	48.58	.001
Unemployed or Housewife	167	53.2%	14	16.3%		
Income*						
low	111	35.4%	3	3.5%		
middle	173	55.1%	70	81.4%	33.67	.001
high	30	9.5%	13	15.1%		
Insurance*						
public	229	72.9%	77	89.5%		
private	15	4.8%	9	10.5%	25.24	.001
uninsured	70	22.3%	-	-		

Note: * P≤0.001, **P≤0.01

Nevertheless, the mean social influence score was lower for the adherent (M=19.65, SD=2.090) compared to non-adherent (M =21.02, SD=2.851).

Correlation Matrix of the psycho-social Variables

The Pearson correlation was used to observe whether a relationship exists between knowledge, self-efficacy, beliefs, social influence, and barriers towards mammography use (Table 2). There is a slight positive association between self-efficacy and social influence (r=0.28, p<0.01). On the contrary, there is a strong positive correlation between self-efficacy and belief (r=.84, p<0.01) among women towards participation in mammography. While, there are strong negative correlation between self-efficacy and barriers (r=-.75, p<0.01) as well as belief and barriers (r=-.75, p<0.01)

Furthermore, results show social influence has a significant slight positive correlation with belief (r=.25. p<0.01). While there is a slight significant correlation or association between barriers and social influence (r=-.15, p=.002). There are moderate positive correlations between knowledge and self-efficacy (r=.52, p<0.01), belief (r=.48, p<0.01), social influence (r=.43, p<0.01). On the contrary, there is a moderate negative correlation between knowledge and barriers (r=-.56, p<0.01).

Table 2. Correlation Matrix of Variables

	Knowledge	Self-efficacy	Belief	Social influence	Barrier
Knowledge	_				
Self-efficacy	.529**	_			
Belief	.483**	.841**	_		
Social influence	.438**	.283**	.253**	_	
Barrier	-.561**	-.757**	-.756**	-.154**	_

Note: ** p≤0.01 (2 tailed)

Table 3. Odds Ratios for Mammography Uptake and Related Factors from Logistic Regression Analysis

				95.0% CI	
	B	p	Odds ratio	Lower	Upper
Knowledge	-0.232	0.446	0.793	0.436	1.441
Self-efficacy	2.156	0.0001	8.641	2.843	26.259
Belief	-2.004	0.01	0.135	0.029	0.618
Social influence	-3.019	0.0001	0.049	0.015	0.159
Barriers	-0.264	0.0001	0.768	0.683	0.864
Age	-0.115	0.643	0.892	0.549	1.449
Education	-0.392	0.306	0.676	0.319	1.431
Occupation	1.761	0.006	5.819	1.661	20.377
Marital status	0.003	0.995	1.003	0.393	2.556
Income	-0.478	0.335	0.62	0.234	1.64

Hosmer and Lemshow goodness –of-fit test, p=0.686

Multivariate Predictors of Mammography Uptake

We carried out binary logistic regression using the enter method to evaluate the relative contributions of psycho-social and demographic factors as predictors of mammography utilization among Iranian women. The independent predictors of mammography adherence are presented in table 3. Results of this study showed that participating women in mammography are almost nine times more likely to have self-efficacy towards participation (95%CI: 2.84-26.25). In contrast, women who followed their doctors', friends', or family's advice showed that they were under social influence or subjective norms have participated in mammography 0.049 time less than the others (95%CI: .01-.15). Likewise, women's beliefs decrease the mammography rate about 0.135 times (95%: .02-.61). In addition, barriers are also negatively associated with women's mammography adherence, (95%CI: .68-.86). Among social demographic factors, occupation is a significant factor enhancing mammography screening in Iranian women. Women with full employment are nearly six times more likely to participate in mammography comparing the non-adherent women (95%CI: 1.66-20.37). Additionally, there was no significant relationship between knowledge of mammography and mammography uptake (p= 0.446).

Discussion

Enhancing mammography screening in Iranian women is a national priority. The results presented in this paper shed light on specific psychosocial and demographic factors associated with mammography adherence among women attending outpatient clinics in Tehran, Iran. The results are some of the first comprehensive, community-based estimates on mammography screening and its predictors.

Having done this study, we found that a likelihood of those who ever had a mammogram among Iranian women attending outpatient clinics was associated with self-efficacy in the ability to perform mammography. Regarding self-efficacy, Bandura (1977) observed that low self-efficacy shows avoidance behavior among people and in reverse, high self-efficacy tends to result in initiating behaviors and high efforts to seek treatment. Similarly, self-efficacy was investigated as a significant predictor of participation in previous studies (Lechner, 1997; Savage, 1996). The majority of women also lacked confidence in performing breast self exams (Shirazi, 2006). A significant positive relationship has been also found between breast self-exam and self-efficacy (Brailey, 1986,: Edgar et al., 1984). Self-efficacy was positively correlated with attendance at the breast screening exercise (Straughan and Seow, 2000). One must keep in mind that in order for a woman in Iran to be eligible for mammography, a physician must refer her. This might have resulted in an over estimation of the frequency of this attribute among women attending in outpatient clinics.

In addition, beliefs, social influence, and barriers are also significantly associated with women's adherence to mammography, negatively as observed in this study. Specifically, we anticipated that greater self efficacy, more positive belief, greater social influence and lower barriers concerning mammography utilization yielding higher mammography uptake. But using logistic regression, we demonstrated that beliefs and social influence were two factors that have significant negative association with mammography in Iranian women. It is well assumed that participating women might resist the influences of doctors', friends' or family's advice due to their fear and worries about knowing cancers during mammography.

The demonstrated gap between beliefs and social influence towards mammography and having a mammogram in this study is not consistent with previous studies done by other researchers. For instance, other authors have found that social influence was a significant factor of behavioral intention (Bosompra, 2001; Smith & Biddle, 1999). In addition, Sorensen et al. (1998) documented that social network influences were significantly associated with mammography intention in the women's community.

Social support, including employers, colleagues in the workplace, family, and friends, can be improved through appropriate health education campaign, then it is likely that a more positive attitude toward preventive health care will be provided (Straughan and Seow, 2000; Abdullah and Leung, 2000; Juon, et al., 2004). Similarly, several researchers showed strong relationships between beliefs and health behaviors, such as mammography (Rakowski et al., 1992; McPhee et al., 1997; Poss et al., 2001; Sheeran et al., 2002; Ajzen, 2004).

Consistent with this study, Wallace (2002) noted self-efficacy and barriers as the strongest predictors of diseases prevention. We also found that barriers were also significantly associated with women participation in mammography. Adherent women were dealing with barriers almost 0.76 time less than non-adherent women.

Previous studies have noted that perceived barriers were significantly related to mammography screening among women (Maxwell, et al., 1998, Choi, et al., 2001; Yarbrough and Braden 2001; Benner, et al., 2002; Juon, et al., 2004; Nissan, et al., 2004; Parsa, 2006). Therefore, policy makers should consider potential barriers especially among women who do not use the health care system in Iran in developing health programs.

Among socio-demographic factors, only occupation was significantly associated with mammography use. In other words, mammography compliance among Iranian women was job-related. Consistent with the result, Madan, et al. (2000) and Parsa (2005) noted that employment was a significant predictor for breast cancer screening. Besides, higher levels of income, health insurance, and access to health care reduce the feelings of powerlessness, denial, and turmoil (Saint-Germain and Longman, 1993). Nowadays, there are some health promotion programs in workplaces in Iran which are helpful in raising women's awareness on breast cancer prevention and having mammography.

Carrying out this study, we demonstrated that knowledge was not a significant predictor for mammography uptake among Iranian women. Schulter (1982) also documented that no correlation between breast cancer knowledge and screening behaviour. According to Reddy and Alagna (1986), the relationship between knowledge and participation in mammography is not simple. To the contrary, previous studies showed that knowledge is one important influencing factor in mammography use (Danigelis et al., 1996; Jarvandi et al., 2002; Secginli et al., 2006; Han et al., 2000; Miller and Champion, 1996; Parsa, 2006).

The results of some studies carried out in Korea (Lee et al., 2000; Im, et al., 2004), Singapore (Straughn and Seow, 2000) Malaysia (Hisham and Yip, 2003), Iran (Jarvandi et al., 2002) showed that not only the women did not perceive the importance of early detection of breast cancer, but also they had inadequate knowledge on breast cancer and screening test.

Among four psychosocial variables, self efficacy contributed the most to the explanation of mammography. Another interesting observation was that the adherent group, who had a mammogram in last two years, had less social influence as a motivating factor compared with the non-adherent group. More qualitative studies need to be carried out in order to find out how self efficacy has an effect on Iranian women's decision to get a mammogram.

On another points, in developing health educational programs it is crucial to teach skills that enhance self efficacy. Additionally, informing women about how easy it is to obtain a mammogram may be another strategy for improving preventive behaviors, particularly among older, uneducated, low-income and jobless women.

As with all cross-sectional studies the results do not set up a casual relationship between psycho-social variables, demographic factors, and mammography. This would result in an overstatement of the value of the study included selected theories as it is hard to tackle them all in any single study. In this study, we examined mammography utilization in the last two years, thus the results of the study are limited to the ability of the participants to remember past behaviour. Additionally, this study did not focus on whether they had regular or occasional mammogram test, as well as maintenance of mammography adherence. Another limitation is social desirability bias with all face-to face survey interviews which may have occurred in this study.

Conclusion

We have identified that adherence to mammography was significantly associated with self-efficacy, barriers, social influence, and beliefs. We also revealed that having a mammogram was well attributed to self-efficacy that might originate from women's occupation. Social influence, belief and barrier, have a negative effect on the mammography use among Iranian women. In addition, the negative contribution of beliefs and social influence in the prediction of mammography use points out that their effects may be mediated through other psychosocial variables.

We found that the role of occupation in the decision to obtain a mammogram was highlighted by the interaction between women's occupation and self-efficacy. We suggest that the theoretical-based future interventions should focus on specific psychosocial and demographic factors. Among the theoretical constructs, self-efficacy had the most impact on women's ability to adhere to mammography screening. Therefore, using an individualistic approach for future interventions can increase mammography utilizations.

Additionally, health planning needs to be decentralized and diverse populations such as illiterate, low-income and jobless women should be considered as a priority in the future interventions. Besides, educational programs and messages on breast cancer and its prevention should be socio-demographically suited for various social groups of women. In principle, any program regarding breast cancer prevention should be free for vulnerable unemployed women so as to empower them in the breast cancer issue. These findings provide health care professionals new information for the development of a culturally tailored breast cancer screening intervention among Iranian women.

Acknowledgements

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