**Original Article**

# The Investigate Factors on Screening of the Breast Cancer Based on PEN-3 Model in Iranian Northern Women

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**Accepted:** 2015/08/30 **Received:** 2015/7/4

**Abstract**

**Introduction:** As much as the women`s behavior for the premature diagnosis of the breast cancer is affected by the cultural and social factors, the purpose of this study is to investigate factors associated with screening accordance with the model PEN-3.

**Materials & Methods:** The present study was cross-sectional. The samples studied were women above 20 years and the sample size was 1416 people. The method of sampling was a random cluster. The tools of data collection questionnaire with 70 questions which approved its content validity and reliability. Data were analyzed by using software of SPSS Ver. 20.

**Results:** The average age of samples was 35.71±6.1. Only 14.3% of samples are regularly conducted to the self-examination. Also, 38.5% of women had a history of the clinical examination. The difference of observed in performance the breast self-examination and clinical breast examination were the statistical significant by variables of rural or urban (P= 0.005), the marital status (P = 0.013) and a background of having breast cancer (P <0.001). The results of the study based on PEN-3 model were showed that there were a statistical significant relationship between the structure of perceptual factors and reinforcing factors (P=0.002) and between the perceptual factors and enabling factors (P=0.006).

**Conclusion:** According to the results of presented, the women`s performance in using the screening was low. Also, the components status of the PEN-3 Model (factors of perceptual, enabling, and reinforcing) for the breast cancer screening in women studied were not suitable

**Keywords**: Breast cancer, PEN-3, Screening, Model, Education

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## Introduction

The breast cancer is the second most widespread cancer within women following the lung cancer, and is regarded as the most common cause of death in women [1-2]. The incidence of the breast cancer in Iranian women is still set at the first position. In 1388, according to the Ministry of Health and Medical Education, 7582 persons were infected with the breast cancer and the special incidence rate (age specific rate) was reported about 28.25% in thousands [3-4]. Iran as an under-developed country is transitioning from epidemiological state into non-epidemiological state. Cancer, the third cause of death in Iran, has been increased during the recent decade [5]. If the breast cancer is diagnosed early, more than 90% of population with breast cancer will be treated. The best ways of premature diagnosis is perceived to be screening [6].

The screening methods for the diagnosis of the disease include self-examination ways (Brest self-examination or BSE), the clinical examination by a doctor or other health staffs (The clinical breast examination) and mammography[1]. Studies in America indicate that the rate of monthly breast self-examination differ from 29% to 63%. This rate is reported about 18% in Nigeria and about 17% in Iran. The various factors such as population variables, awareness and education levels, as well as social and economic conditions affect breast self- examination[7].

Poverty, lack of health insurance and increasing the age are recognized as effective factors in the clinical examination of the breast in women in the various regions of the world. Regular breast self-examination is prevented due to not knowing the importance of sequentially examinations, fear and anxiety. Studies have shown that the rate of using these methods have been more reported within women who have more knowledge about the breast cancer screening methods[8].

Theories and models in health training provide a comprehensive structure in order to predict the determinant factors of the behavior, which can lead to the effectiveness of the health training programs[2]. In truth, the models are regarded as the frameworks for understanding how people learn and behave, as well as why they behave so, among which PEN-3 model can be mentioned taking culture into account as the basis in the preventive treatment or promoting behavior of health level[9-11]. In this model, the health beliefs and behaviors should be assessed in terms of cultural, historical and political fields[12]. PEN-3 model is comprised of three dimensions each of which contains abbreviations of PEN and are interdependent to each other internally. The first dimension of PEN model encompasses "person". As a matter of fact, it emphasizes that the health training should obligate the person to be more sensitive in regard with the improvement of healthy behaviors. The extended Family (Extended Family), health education, not only should consider one person, but also it should consider the person`s relatives. Moreover,



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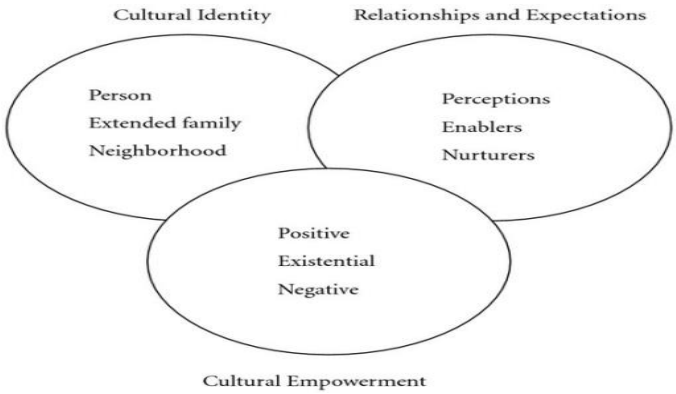
neighborhood and community should be taken into consideration in the health education programs, and for this purpose, the engagement of community leaders for the appropriate health planning from the cultural point of view seems very essential. The second dimension of PEN-3 model is educational diagnostics of healthy behavior that includes perception; perception in this model encompasses knowledge, beliefs, attitudes, and values that can facilitate or prevent a motivation to change the specific behavior. Enablers (Enablers) are in fact the social forces that can be effective in increasing the healthy behaviors or in creating obstacles for preventing their occurrence. Supporters are affected by the persons who are important for them and follow them. The cultural beliefs related to the health are the third dimension of PEN-3 model (Figure-1). The existing cultural beliefs could have an effect on behavior in society that is to say positive cultural beliefs are enablers and supporters who have the positive impact on the performance and health behavior of an individual, involves family and society. Intermediate (Exotic), includes the performances that have no specific impact on the actions related to the social health and in fact they are null behaviors that need no change. The negative performances are cultural beliefs with a negative feedback on the perceptions, enablers and supporters in society and lead to the negative performance of individual, family and society that finally hurt the health [11-14].

Kissal's study in Turkey has introduced the barriers to the screening of such factors as lack of awareness, fear, neglect, delay, embarrassment, religious creed, disability in going to the doctor, lack of doctor's advice and attitude of the health professionals [9]. In Sheppard' s study on the breast cancer in the PEN-3 model, the most important perceptual factors consist of acceptability, trust in Allah, fear, religious beliefs, other individuals' experience of s and, Cancer Myth. Moreover, the most important enabling factors are access, skill, employee`s negligence and the most important factors of supports are family members, family`s negative actions, awareness lack of family and society members [10]

Since the women`s behavior in regard with the premature diagnosis of the breast cancer is affected by the cultural and social factors, t this study aimed to investigate the factors associated with screening and classifying based on the framework PEN-3 model structure.

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**Figure-1.** The PEN-3 Model [Based on information obtained from Airhihenbuwa & Webster, 2004]




## Materials & Methods

This study is a cross-sectional (descriptive) study carried out in 2014. The study population includes women above 20 years from a northern province, Mazandaran. According to the study type, sample size was determined using the below formula (p=0.25, 1-p=:0.75, α=0.0.5, d=0.1p, design effect=1.3).

$$n = \frac{z^2_{1-\frac{\alpha}{2}} p(1-p)}{d^2}$$

The sample size was 1416 people, which was selected via a random cluster sampling method. The fixed cluster for ten families in the whole province was calculated based on 17 cities and divided by weight in the under-supported cities among the urban and rural families. Out of 141 clusters of ten families including 81 urban clusters and 60 rural clusters were divided. The children vaccination book was used in order to select the main cluster.

in order to glean the study data, a questionnaire was utilized comprising of 70 questions: 11 questions about demographic information and 9 questions women`s performance in regard with the of the premature diagnosis ways of the breast cancer. Furthermore, there were 50 questions in the form of PEN-3 about the perceptual factors, 24 questions about the enabling factors, 13 questions about the supporting factors.

To measure the performance of the breast cancer screening methods including the breast self-examination and mammography, questions with alternatives of Yes and No(scores of 1 and 0) were asked. Questions with 5 alternative answers by means of Likert To assess the construct of perceptual factors, based on direct or reverse. Alternatives are listed as highly agree with a score of 5, agree with a score of 4, neither agree nor disagree with a score of 3, disagree with a score of 2, and highly disagree with a score of 1.

To assess the structure of enabling factors and reinforcing factors were probed, questions with Yes, No answer (scores of 1 and 0). The content validity of the questionnaire has been substantiated based on the professionals` point



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of view. Moreover, reliability was calculated through Cronbach's alpha. The reliability for the test performance was 83% and 81% for the perceptual factors, 78% for the enabling factors, and79% for the reinforcing factors.

The questionnaires were completed by going to householders. The study data were analyzed using SPSS software (Ver. 20) applying descriptive statistics, mean ± SD, Pearson coefficient, and Chi-square.

## Results

The study findings revealed that the average age of samples was 35.71±6.1. 38.5% of samples lied in the age group of 20-30 years and 30.8% were placed in 31-40 age group. Regarding the sample marital status, 87% were married.

As it is shown in Table 1, 50 % of the partcicipants showed that the most level of education was the moderate of education level. Meanwhile 6.1% of the studied population had a history of breast cancer in their extended families and 9.5 % of women themselves had a background of a benign breast cancer.

The study results in regard with the screening breast cancer 46% of women had a history of self-examination and 52.1% did not have any self-examination at all. In this study, only 14.3% of women regularly conduct the self-examination. Moreover, 38.5% of women had a history of the clinical examination and 13.5% of the women had a history of mammography and 61% do not perform the clinical breast examination. In the present study, 20.7% regularly perform the clinical breast examination.

a significant difference was detected between performance of rural or urban women in regard with the breast self-examination as well as the clinical breast examination ($P = 0.005$, $\chi2 = 5.8$). The performance of married women with self-examination was significantly related to their marital status ($P = 0.013$, $\chi2 = 5.8$). The performance of women in the clinical examination and mammography with a history of a person`s disease to the benign breast had a significant relation ($P <0.001$). No statistically significant relation was observed within the women`s performance about the premature diagnosis with a history of breast cancer in the family.

The results of the study based on PEN-3 model are shown in details in Table 2 involving perceptual factors structures, structures of enabling factors, reinforcing factors in the three-part structure, positive, negative, and ineffective. In this section, some of the major structures within the PEN-3model will be referred to.

**Structure of the positive perceptual factors (Positive perception)**

Seven factors have been measured in this structure. The most positive important perceptual factors are: women's awareness of the risk factors, the breast cancer screening methods (66 %), beliefs in BSE, the clinical breast examination by a doctor, mammography of the breast fin diagnosis and the treatment of malignant tumor (85.3%).

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**Structure of negative perceptual factors (Negative perception)**

Nine factors were measured in this structure. The most negative perceptual factors belonged to the idea that the breast cancer is not preventable (26.8%). The lack of belief in the screening methods and not giving priority to it can be mentioned as other important factors (19.7%).

**Structure of ineffective perceptual factors (Existential perceptional)**

The most important ineffective perceptual factors has been the lack of confidence in the free screening service (18.7%).

**Structure of the positive enabling factors (Positive enablers)**

. The most positive enabling factors have been the availability of the health department, the doctor's office to get the information about the breast self-examination, doing the breast clinical examination (86.7%) and the women`s skill in doing the breast self-examination (51.3%)

**Structure of the negative enabling factors (negative enablers)**

In this structure seven factors were measured, among which the most important negative enabling factors can be mentioned as lack of BSE and mammography and the clinical breast examination by a doctor due to the busy and lack of time (30.1%), the painful BSE and mammography and clinical breast examination by a physician (22.7%).

**Inert structure of enabling factors (existential enabler)**

In this structure two factors were measured. The most important ineffective enabling factors: time consuming of the screening procedures (23.8%).

**Structure of positive reinforcing factors (positive nurtures)**

In this structure, 9 factors were measured. The most important positive reinforcement factors were agreement among the woman`s family members (64.9%), doctor`s recommendation for screening (83.4%) and the encouraging mass media to the screening (74.7 %).

**Structure of a negative reinforcing factor (negative nurtures)**

In this structure two factors were measured, which the main negative reinforcement factor involved the husband`s disagreement with a clinical examination and mammography (7.3%).

Moreover, based on the Pearson Correlation Coefficient, there was a statistical significant relationship between the structure of perceptual factors and reinforcing factors (Pearson 0.616, P=0.0025) as well as between the perceptual factors and enabling factors (Pearson: 0.07, P=0.006), whereas no statistically significant relationship was found



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between the enabling factors and reinforcing factors.

**Table-1:** Demographic characteristics of participants

| characteristic | | Number | % |
|---|---|---|---|
| **Age group** | 20-30 | 545 | 38.5 |
| | 31-40 | 436 | 30.8 |
| | 41-50 | 370 | 19 |
| | >50 | 165 | 11.7 |
| **Married status** | married | 1231 | 87 |
| | single | 119 | 8.4 |
| | divorced | 17 | 1.2 |
| | widow | 47 | 3.3 |
| **Education** | Low | 406 | 28 |
| | intermediate | 708 | 50 |
| | excellent | 302 | 21.8 |
| **Job** | employed | 208 | 14.7 |
| | Householder | 1117 | 78.9 |
| | Student | 73 | 5.2 |
| | Unemployed | 8 | 0.6 |
| **Background of breast disease** | YES | 134 | 9.5 |
| | NO | 1282 | 90.5 |
| **Positive background in family** | First-grade families | 86 | 6.1 |
| | Second-grade families | 142 | 10 |
| | Without Positive background in family | 1188 | 83.9 |
| **Total** | | 1416 | 100 |

**Table 2-** The perceptual, enabling and reinforcing factors based on the PEN-3 Model

| structure | positive | % | negative | % | ineffective | % |
|---|---|---|---|---|---|---|
| **Perceptual** | Knowledge | 66.5 | Preventability of cancer | 26.8 | Lack of confidence to free services | 18.7 |
| | Relieving women` s anxiety | 84.6 | | | | |
| | | | No belief in screening | 19.7 | | |
| | Belief in premature diagnosis of tumor | 85.3 | | | | |
| | | | Sense of lack of ability to screening | 34.9 | | |
| | women`s health | 86.6 | | | | |
| | Positive background of relatives and probability of increasing others` infection | 75.4 | Persistence and perseverance in screening | 13.3 | | |
| | | | Lack of confidence in health personnel | 16.1 | | |
| | Positive background of benign disease and probability of increasing infection in person | 73.4 | | | | |
| | | | Lack of belief to infected to disease | 16.32 | | |
| | | | Worry about screening | 19.4 | | |
| | Screening and decreasing in death | 85.2 | Fear of screening | 18.6 | | |
| | | | Embarrassment of | 20.1 | | |

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| structure | positive | % | negative | % | ineffective | % |
|---|---|---|---|---|---|---|
| | | | screening | | | |
| **enabling** | Access to educational & examinational centers | 86.7 | Risks of screening | 15.9 | Negligence and forgetfulness | 4.47 |
| | | | Being very busy and not having enough time | 30.1 | | |
| | Health personnel`s skill in screening | 85 | | | Being screening time-consuming | 23.8 |
| | Women`s skill in screening | 51.3 | | | | |
| | | | Painful of screening | 22.7 | | |
| | Afford the cost of screenings | 66.2 | | | | |
| | | | Religious beliefs | 5.7 | | |
| | Having treatment book | 86.4 | | | | |
| | | | Lack of attention to cultural issues | 11.9 | | |
| | Access to mammography center | 51.6 | | | | |
| **reinforcing** | The encouragement of husband to screening | 53.3 81.2 | Husband`s disagreement with screening | 4.9 | Systematic and regular screening | 37.2 |
| | Agreement of woman`s family | | Husband`s disagreement with clinical examination & mammography | 7.3 | | |
| | Agreement of husband`s family | 64.9 | | | | |
| | Friends` advice | 72.3 | | | | |
| | Doctor`s advice | 83.4 | | | | |
| | Advice of health personnel | 59.1 | | | | |
| | Interest and motivation | 52.3 | | | | |
| | Advice of religious leaders | 33.7 | | | | |
| | The encouragement of media | 74.7 | | | | |

## Discussion

In this study, factors contributing to the breast cancer screening based on the PEN-3 model were studied. According to the presented results, the rate of women`s performance in regard with using the screening was reported low. The based on the structure of the PEN-3



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Model, the most positive perceptual factors in the breast cancer screening included increasing women's health, in time diagnosis of tumor, death decrease in, having the positive family background and the background of benign disease of the person and the most negative perceptual factors were included such as feeling of the lack of ability, the unpreventable diagnosis of the cancer, the screening disbelief, stubbornness, the lack of believing in staffs` work, the lack of believe in infecting to disease, anxiety, fear, and most in effective perceptual factors were included such as shyness and the lack of believe in the free services.

Moreover, the most positive enabling factors were reported as availability, personnel skill, cost, and the most important negative enabling factors entailed mammography risk, being busy, painful, religious beliefs and cultural issues, the ineffective factors of negligence and time-consuming. Meanwhile, the most important positive reinforcement factors were the encourage, approval of her husband and family, friends` and doctor`s advice and motivation and media communication. The most important negative reinforcing factors were the husband`s disagreement and family members and the most important inert reinforcing factor was the behavior repetition.

Based on the results of this study in the premature diagnosis, only 14.3% of women regularly undergo the self-examination. The index of premature diagnosis in the study conducted by Montazeri in Iranian women was reported 17% [1], in the study of Parsain Malaysia, 19% [15], Ceber in Turkey 27.7%[16], and Olugbega in Nigeria 17.6%[17]. The World Health Organization offers encouraging and empowerment of women to perform the breast self-examination as a method of identification and the premature detection of the breast cancer to the under-developed countries. Furthermore, in the national program of the controlling breast cancer, the Islamic Republic of Iran emphasized on the educating as well as participating of women in regard with the screening methods [1-2]. Therefore, according to the role of BSE in increasing women's attention to the breast health, the rate of the breast self-examination in women was reported low.

In the present study, only 20.7% of women were regularly reported to perform the clinical examination by a physician. The clinical examination was in Olugbega study 24%, 25% in Parsa, 14.1% in Camo [15, 17-18]. Since about one-fifth of women do the breast clinical examination, this rate is regarded very low according to the clinical breast examination as a diagnostic method which is emphasized by the World Health Organization as well as the National program for controlling the Breast Cancer in Islamic Republic of Iran.

In the present study, 13.7% of women had a mammogram of which only 3.5 percent did it regularly. Olugbega reported this rate as 14.3%, and Parsa mentioned 13.6% rate [15, 17].

In the Kissal's study, low knowledge, fear, shyness, negligence, religious beliefs and the lack of recommendations of the doctor were

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mentioned as preventive factors in the screening. Also, such factors as fear, knowledge, the positive relative background, the social supporting and the doctors` recommendation factors were taken in to account as facilitative factors [9]. In Rosmawati study, a poor performance in regard with breast cancer screening was associated with the lack of knowledge about the way of self-examination, the lack of awareness of cancer symptoms, the lack of motivation and support from family members, spouses and friends [19]. In the study conducted by Parsa, three determining factors were proposed such as knowledge about the breast cancer, confidence to perform the regular breast self-examination and regular visit by the doctor [15].

In Naghibi's study, the lack of skills and the lack of the self-examination by itself, fear, busy and anxiety were mentioned as barriers to BSE [20]. In Sheppard study that was carried out based on the PEN-3 model about the breast cancer, the most important perceptual factors were acceptability, the religious beliefs, trust in God, fear, other experiences, and the legend of cancer. Moreover, the most important enabling factors were access, job skills, the negligence of providers and the major reinforcing factors were family members, the negative reaction of family and unawareness of the family and social members [10]. In Ka'opua's study conducted on the basis of PEN-3 Model, the most important perceptual factors were strong religious beliefs, acceptance, fate and fatalism, low awareness, cultural biases and the most important enabling factors were money, insurance, access, low-skills of supporters and the foremost reinforcing factors were family, and the high level of self-confidence [21].

In a study conducted by Misharvasi, three social factors that influenced mammography were introduced that entailed individual factors such as pain, behavioral factors such as stress and social factors such as social support, optimism, hope and positive treatment outcomes [22] .Young et al. proposed that factors influencing women's decisions with regard to BSE are influenced by the personal and social factors [23]. In the study of Simou in discussing on factors affecting screening, the social factors, demographic characteristics, lifestyle and the medical history are mentioned [24].

In the above studies in different countries, the role of social, cultural and individual factors on women's attitudes, decisions of as well as their attention to the breast cancer screening methods were taken into consideration. Therefore, the perceptual factors dimension was emphasized including the low knowledge, skill, fear, embarrassment, concern, positive family background, acceptability. Moreover, the enabling factors dimension included women's skills, access, the skill of health personnel, funds and insurance, and the reinforcing factors dimension entailed the social and family support and the recommendations of doctors, health workers and others. It is worth mentioning that the



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results of those studies are in line with the findings of the present study.

One of the limitations of the present study is self-reported of participants in complete some of variables and components of studied at questionnaire that likely to be exaggerated in response to its.

## Conclusion

Results of the present study demonstrated that the components status of the PEN-3 Model structures including factors of perceptual, enabling, and reinforcing for the breast cancer screening in the studied women were not reported to be at an appropriate status which requires more planning as well as more educational interventions.

Undoubtedly, encouraging women to use the screening methods in regard with the breast cancer needs to collect information and comprehensive understanding in arranging of socio-cultural ones for compiling and analyzing the data in terms of structure PEN-3 model for each of the three factors of the positive, negative and ineffective determined training strategy and the strategy of the message type for intervention.

## Acknowledgements

The authors would like to thank Health Sciences Research Center staff in Mazandaran university of Medical Sciences for their assistance. Meanwhile the present study was confirmed in Ethics Committee of Mazandaran University of Medical Sciences.

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