

RESEARCH ARTICLE

Meta Analysis of Studies about Breast Self Examination between 2000-2009 in Turkey

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Abstract

Aim: The aim of this study was to analyze studies in Turkey about self-breast examination and produce conclusive, reliable and detailed basis for future studies. **Methods:** Studies performed between 2000 and 2009 (until the end of September) were retrieved from databases using breast cancer, breast examination, breast cancer screening and risk factors as key words. Fifty-nine studies were identified and 18 of them (15 journal articles and three theses) were used for the meta-analysis. **Results:** Married women and women with a family history of breast cancer were found to perform self-breast examination more frequently than single women and women without a family history of breast cancer, respectively (OR=1.02 % CI 0.82-1.63; OR=1.16 % CI 0.82-1.63). According to the *health belief model* scales, women performing self-breast examination were determined to have 1.7 times higher susceptibility (OR=1.70), 1.34 times higher seriousness perception (OR=1.34), 3.32 times higher *health motivation* (OR=3.32), 5.21 times more self-efficacy/confidence (OR=5.21) and 2.56 times higher self-breast examination benefit perception (OR=2.56). **Conclusion:** Nursing care models caused an increase in self-breast examination by women, and thus, it may be useful to organize and evaluate such health-related programs and consider women health perceptions.

Keywords: Breast cancer- breast self examination- meta analysis- nursing- Turkey

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Introduction

Breast cancer is a serious and global health problem that threatens women health. Breast cancer is the most frequently diagnosed cancer and the leading cause of cancer related deaths in females worldwide, accounting for 23% (1.38 million) of the total cancer cases and 14% (458,400) of the total cancer deaths in 2008 (Globocan, 2008; Jemal et al., 2011). According to The United States Cancer Statistics, around 230,480 women receive new diagnosis of breast cancer every year in America, and approximately 39,520 people die from this disease (United States Cancer Statistics, 2012).

Breast cancer is the most common type of cancer seen in women in Turkey and its incidence rate is 35.47/100000 (Turkey Cancer Statistics, 2005). Early diagnosis is the most effective method to reduce morbidity and mortality in breast cancer. Certain methods like clinical breast examination, breast self-examination (BSE) and mammography has been defined as activities facilitating the early diagnosis and improving health and they are accepted as golden standards for early diagnosis of breast cancer (Avcı et al., 2008b; Gerçek et al., 2008; Ertem and Koçer 2009; Gürsoy et al., 2009).

There are many studies implemented on this subject in Turkey as in all over the world. Especially there are more studies carried out by nurse researchers about BSE and *health belief model* (HBM) (Çenesiz and Atak, 2007; Ergin et al., 2011). In the investigation of these studies, it is determined that women have inadequate information about BSE and the rate of regular BSE application is quite low in Turkey (Harputlu, 2005; Gölbaşı et al., 2007). The studies have reported that the main reason why women do not perform this examination is the fear of finding a mass and not knowing what action to take and they do not have enough knowledge about application stages (Harputlu, 2005).

In the studies, health beliefs are reported as the most important factor affecting breast cancer screenings (Eroğlu and Kılıç, 2011). Health beliefs have been more widely used to form hypothetical framework of studies investigating breast cancer screening behaviors like BSE and mammography. For this reason, meta-analysis is required to obtain more reliable and valid results with the studies.

Meta-analysis is a statistical method carried out to obtain more reliable and valid results about the study subject gathering published or unpublished studies

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implemented about the same subject in different locations and times. In searching an answer to a specific problem, a special attention is given to research and sources with highest hereditary power (Şahin, 1999; Temel and Karaağaoğlu, 2001). Meta-analysis studies are important sources of information for proof-based medical applications. In the classification of Scottish Intercollegiate Guidelines Network (SIGN), meta-analysis studies are regarded as the highest level of proof. (Scottish Intercollegiate Guidelines, 2010) Meta-analysis studies have gained importance at present when medical and health literatures increase.

The aim of this study is to reach more reliable and valid results through concomitantly analyzing the studies about breast self-examination for protection against breast cancer and provide proof-like information to health staff and insight for future studies.

Materials and Methods

All the studies performed by nurses researchers about breast cancer in Turkey between 2000 and 2009 (until the end of 9th month) were searched through with such keywords as “breast cancer, breast self-examination, breast cancer screening, and risk factors”. Selected publications were divided into three groups as thesis, congress abstract books-congress books and scientific journals related to this subject (Breast Health Journal, Syndrome, Health and Society, Family Health Journal, Nursing Journal etc). During screening process, some studies performed in Turkey and published abroad were also encountered, and they were also included in the study. It was paid attention to reach full texts of all studies and these studies were grouped as breast self-examination, breast cancer risk factors and other publications about breast cancer. A total of 59 studies were reached about BSE; however, only 18 of them (15 published in full-text and 3 theses were used in the study. Family history of BSE was found in 18 studies, while BSE history and *health belief model* (HBM) were used in 5 studies.

These studies were considered in terms of study location, time and individual characteristics (sample unit number), study planning design, study variables, measurement units, grouping criteria of variables, statistical analysis methods, published or unpublished study test results, publication style of study results and study results (Figure 1).

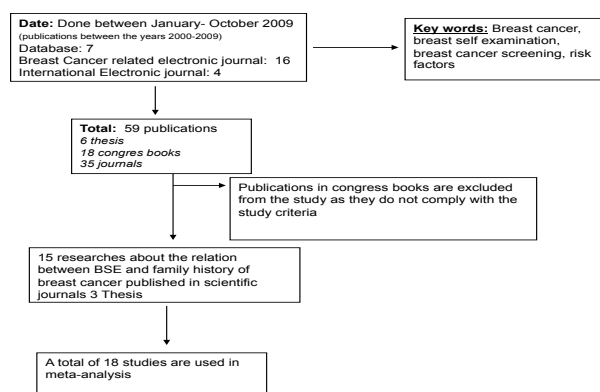


Figure 1. Algorithm of Study Selection Criteria

Data analysis

Treatment effects were summarized as odds ratios (ORs) for categorical variables and standardized mean difference (SMD) of effect for continuous variables with 95% CIs. Estimates from individual trials were pooled by using the DerSimonian and Laird random-effects-model. SMD=0.2 was accepted as small effect size, while SMD=0.5 was accepted as moderate effect size and SMD=0.8 as large effect size. Meta-analysis was performed with STATA (Şahin, 1999; Temel and Karaağaoğlu, 2001).

In meta-analysis, comparisons were made in line with *Health Belief Model Scale* (HBMS) used in many studies indicated that Turkish adaption of HBMS of Champion was made in three different studies in Turkey (Gözüm and Avcı (Aydın), 2003; Karayurt and Dramalı, 2003; Seçginli, 2003). The scale has a 42-item form consisting of 6 sub-dimensions. These dimensions include “sensitivity”, “caring/seriousness” and “health motivation”, which evaluate breast cancer and general health state of individuals and “barriers”, “benefits” and “self-efficiency/adequacy” related to BSE, “benefits” and “barriers” sub-dimensions related to mammography (Gözüm and Avcı (Aydın), 2004; Çenesiz and Atak, 2007).

In the analysis, the relation between these six sub-dimensions and making BSE was evaluated and the result was presented in forest plot graphic.

Results

BSE and family history of breast cancer

A total of 18 studies investigating the relation between BSE and family history of breast cancer in line with meta-analysis procedures were used for meta-analysis in the present study and comparisons were made. Individuals with family history of breast cancer perform BSE by 1.25 times more frequently than other women without such history (OR=1.25 %CI 0.90-1.73). However, it was not found significant in terms of effect size ($z=0.83$ $p=0.493$). Forest plot graphic of observational studies about family history of breast cancer is given in Figure 2.

Health Belief Model Scale

The following meta-analyses were performed in

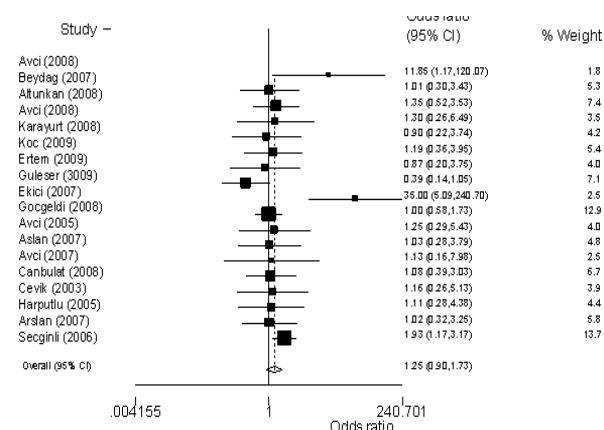


Figure 2. Forest Plot Graphic of Observational Studies about Family History of Breast Cancer

Table 1. Studies Included in Meta-Analysis

| Authors and Date of Study | Study Location and Participant Characteristics | Data Collection Tools (Questionnaire, Scale etc.) | Purposes (Studies using BSE and HBM) | Results | Subdimension Scores of HBM |
|-----------------------------------|--|--|---|--|--|
| 1. Avci 2008a | Muslim female workers at a hazelnut factory (n=103) | A self-administered questionnaire Champion's revised <i>Health Belief Model</i> Scale | Was to identify knowledge levels and performance frequency of breast self-examination (BSE) and to examine variables related to breast cancer screening behaviors in a sample of Turkish women. | Higher <i>health motivation</i> , higher perceived self-efficacy of BSE, marital status, and familial breast cancer history were significantly associated with BSE performance. Higher levels of <i>health motivation</i> and higher perceived self-efficacy of BSE were also significantly associated with knowledge of BSE. | Related to BSE practice, the subscale mean score was 2.96 (SD ¼ 0.98) for susceptibility, 3.41 (SD ¼ 0.76) for seriousness, 3.74 (SD ¼ 0.97) for <i>perceived benefits</i> of BSE, 2.50 (SD ¼ 0.70) for <i>perceived barriers</i> to BSE, 3.29 (SD ¼ 0.69) for perceived self-efficacy of BSE, and 3.30 (SD ¼ 0.81) for <i>health motivation</i> . |
| 2. Beydag (Tasci) & Karaoğlu 2007 | Female students residing in dormitories (n=200) of credit and dormitories | Socio-Demographic Question Form and Questionnaire on the knowledge about breast cancer and breast self-examination | Was to determine the effect of education about breast cancer and breast self-examination (BSE) give to female students living in the dormitory on their knowledge and attitudes. | There was a statistically significant difference between the pre- and post- education mean scores in the students' BSE knowledge acquisition, source of knowledge acquired, BSE performance status and BSE performance frequency (p<0.05). | |
| 3. Altun-kan et al. 2008 | Healthy women between 20-60 years (n= 253) | Questionnaire Form and <i>Health Belief Model</i> for Breast Cancer, Champion <i>Health Belief Model</i> | Was to examine the awareness and practice of BSE among 20-60 years women. | Based on the finding of BSE was not performed monthly basis, we can conclude that the increasing rate of breast cancer at present knowledge and awareness of BSE was not increased. | Awareness (item mean score 8.8 + 2.7) , Self-efficiency (item mean score :33.2+8.5 , Caring/ seriousness (item mean score 20.2+4.4 , <i>Health motivation</i> (item mean score 18.8+2.8 BSE benefit (item mean score 15.5+1.6 BSE barriers (item mean score 20.0+4.1 |
| 4. Avci et al. 2008b | Midwifery students (N=128). | Data were collected using self-administrated questionnaires and Champion's Health Belief Scale | Was to determine midwifery students' health beliefs intended for breast self examination. | Results found midwifery students' BSE health belief scores to be high for perceived seriously, <i>health motivation</i> . | Awareness (item mean score 7.6+ 2.8) , Self-efficiency (item mean score 33.2+8.5 , Caring/ seriousness (item mean score 19.25+5.86 , <i>Health motivation</i> (item mean score 21.59+3.2 BSE benefit (item mean score 16.6+4.6 , BSE barriers (item mean score 15.33+6.32. |
| 5. Karayurt et al. 2008 | nurses (N=100) | Descriptive characteristics questionnaire form and Champion <i>Health Belief Model</i> | Was to determine attitudes and beliefs about breast cancer and BSE. | Thirty-two percent of the nurses performed breast self-examination regularly every month. There was a significant difference in the scores on susceptibility, benefits, barriers, <i>health motivation</i> and confidence between nurses performing and not performing breast self-examination. However, there was no significant difference in seriousness between the groups. The results of this study showed that beliefs were effective on breast self-examination performance. | Awareness (item mean score 9.28 + 2.67) Caring/ seriousness (item mean score 25.81+4.75 , <i>health motivation</i> (item mean score 27.3+2.75 BSE benefit (item mean score 19.31 +3.23 BSE barriers (item mean score 18.84+4.40 Confidence 42.84+7.61 |
| 6-Koc and Saglam 2009 | Female patients hospitalized in internal diseases and gynecology clinics (N=100) | 35-item questionnaire form | Was to determine the knowledge of the females about breast cancer, preventive measures and status of examining their breasts by themselves. | After the educational activity, positive developments were observed on female patients' knowledge and the status of examining their breasts by themselves. For this reason, the female should be informed about risk factors, symptoms, preventive measure for breast cancer and examining their breasts by themselves. | |
| 7- Ertem, and Kocer. 2009 | Midwives and nurses (n=80) | Questionnaire form | Was to determine the effect of education about breast cancer and breast self-examination (BSE) give to female students living in the dormitory on their knowledge and attitudes. | Results of the study indicated that 52% of the sample performed BSE. Approximately 35% of those who performed BSE reported that they acquired information regarding BSE during their work experience. A significant relationship was found between higher levels of work experience and BSE practice. | |

Table 1. Studies Included in Meta-Analysis

| Authors and Date of Study | Study Location and Participant Characteristics | Data Collection Tools (Questionnaire, Scale etc.) | Purposes (Studies using BSE and HBM) | Results | Subdimension Scores of HBM |
|----------------------------|--|--|--|--|---|
| 8. Guler et al. 2009 | Female healthcare workers (n=246) | Questionnaire form | Was to determine the knowledge level and practice frequency of BSE among health-care workers in Kayseri, Turkey. | Healthcare workers had a low mean level of knowledge about the practice of BSE. The scores of the women who stated that they practiced BSE were significantly higher ($P=0.000$) than those who reported that they did not. Healthcare workers need to improve their knowledge and sensitivity for BSE. | |
| 9. Ekici & Utkuallp 2007 | Female educational staff (n=67) | Questionnaire form | Was to evaluate breast self-examination of women who work at university as an instructor. | It is found that most of the women instructors didn't perform monthly breast self-examination. | |
| 10. Goegeledi et al. 2008 | Women over 15 years of age (n=301) | Questionnaire form | Was to investigate of attitudes and behaviors of a group of women who reside at in Ankara Golbasi on self-breast examination | The percent of participants who knew and practiced self-breast examination was determined higher than many previous studies. | |
| 11. Avci and Keskin 2005 | University students (N=172) | Questionnaire form and Champion Health Belief Model | Was to determine nursing students' health beliefs intended for breast self-examination. | Results indicated that nursing students' BSE health belief scores are perceived highly seriously, <i>health motivation</i> , and benefits are perceived moderate, while sensitivity and self-efficacy are perceived as low barriers. | Awareness (item mean score 3.2) Self-efficacy (item mean score 3.01) are moderate; Caring (item mean score 4.1), <i>Health motivation</i> (item mean score 3.88) and Benefits (item mean score 4.04) are high Barrier (item mean score 2.18) perception is low. |
| 12. Aslan 2007 | Nurses University students (n=100) | Questionnaire form | Was to determine the knowledge, attitude and behaviors of Nursing Vocational High School Students about breast cancer. | Around 40% of nursery vocational high school students change their knowledge and behaviors acquired in school about cancer. 41% of nursery students defined mammography process incorrectly, 19% did not perform BSE due to lack of knowledge and 95% did not make BE, which indicated the inadequacy of their knowledge about breast cancer. | |
| 13. Avci 2007 | Women working in a office Health (n=32) | Questionnaire form and Champion Health Belief Model and Control List for BSE application | Was to compare the effect on breast self-examination belief, knowledge, and practicing of education with video. | This study showed that method of education with video was effective in changing health beliefs regarding breast cancer screening, and in the same level, increasing knowledge and practicing of BSE. | Awareness (item mean score 7.47 ± 2.00 BSE self-efficacy (item mean score 33.75 ± 8.63 Caring (item mean score 18.75 ± 5.24 <i>Health motivation</i> (item mean score 18.31 ± 4.22 BSE benefit (item mean score 16.15 ± 2.97 BSE barriers (item mean score 20.12 ± 5.8 |
| 14. Canbulat and Uzun 2008 | Health care workers (n=268). Doctor (n=51); Nurse (n=169) Midwife (n=48) | Questionnaire form and Champion Health Belief Model | Was to examine health workers' health beliefs on breast cancer; Breast Self Examination (BSE) and mammography and to assess the breast cancer risk of the staffs at the age of 35 and over 35 in the same group. | Susceptibility, <i>health motivation</i> to BSE, BSE benefits, BSE self-efficacy perceptions of female health workers who performed BSE were significantly higher than those who did not, and a result indicating that positive health beliefs are effective in stimulating performance of BSE of female health workers. Among the variables related with mammography, only susceptibility perceptions of female health workers who had a mammogram was significantly higher than those who had not had a mammogram. | Susceptibility of doctors, (7.66 ± 3.08) nurses, (8.62 ± 2.84) midwives (8.22 ± 2.85). Seriousness (respectively) (15.70 ± 6.00 , 16.92 ± 5.48 , 15.85 ± 5.26). <i>Health motivation</i> (respectively) (22.33 ± 3.36 , 19.96 ± 4.17 , 19.97 ± 3.56). BSE benefits (respectively) (17.64 ± 3.17 , 16.03 ± 3.62 , 16.25 ± 4.16). BSE barriers (respectively) (13.13 ± 5.60 , 17.42 ± 7.94 , 15.89 ± 7.22). BSE (respectively) self-efficacy (43.78 ± 5.09 , 35.82 ± 7.69 , 38.18 ± 7.24 . |
| 15. Cevik 2003, Thesis | Women with suspicion of mass (n=538) | Questionnaire form | Was to evaluate knowledge level of women applying to hospital about BSE and breast cancer. | Participants had inadequate knowledge about breast cancer, did not perform BSE monthly and accidentally determined mass in their breasts. However, most of the women heard about BSE on TV and radio and health staff only had a small effect in this regard. | |

Table 1. Studies Included in Meta-Analysis

| Authors and Date of Study | Study Location and Participant Characteristics | Data Collection Tools (Questionnaire, Scale etc.) | Purposes (Studies using BSE and HBM) | Results | Subdimension Scores of HBM |
|--------------------------------|--|--|--|---|---|
| 16. Harputlu D 2005- Thesis | Female inmates (n=161) | Questionnaire form and Coopersmith self-respect scale and questionnaire form for BSE knowledge level | Was to determine the relation between self-respect and BSE in female prison inmates | Participants had inadequate knowledge level about BSE. | |
| 17. Arslan 2007- Thesis | Club members (n=200) | Questionnaire form | Was to performe to determine women's knowledge levels about breast cancer and BSE and then to organize trainings on this matter and to increase the efficiency of trainings. | There is no statistically significant difference pre-and post- education knowledge scores ($p < 0.001$). It is quite important for women to learn and apply BSE and to inform women's awareness about recently increasing breast cancer and adopt health promoting behaviors. | |
| 18. Seeginli and Nalcivan 2006 | Population based healthy women (n=438) | Champion Health Belief Model and Questionnaire form | Was to examine health beliefs and socio-demographic and breast cancer-related variables influencing breast self-examination (BSE) practice. | Women who had more confidence in their ability to perform BSE, had health insurance, and were informed about breast cancer were more likely to practice BSE. | Performers had higher mean scores for <i>perceived benefits</i> ($t=3.09$, $p=0.000$) and confidence ($t=8.41$, $p=0.000$). No significant difference was determined between the two groups on the susceptibility, seriousness, barriers, and <i>health motivation</i> subscales ($p > 0.05$) |

order of *Health Belief Model* Scale sensitivity, caring/seriousness, *health motivation*, BSE barriers, BSE benefits and self-efficiency.

Perceived Sensitivity

A total of 5 studies investigating the relation between performing BSE and Sensitivity in line with meta-analysis procedures were used for meta-analysis in the present study and comparisons were made.

There was a difference between the sensibilities of women performing and not performing BSE (*pooled SMD*=0.29, 95%CI 0.17-0.40, $p < 0.001$). Sensibility of women performing BSE had moderate level of effect.

Perceived caring/seriousness

A total of 5 studies investigating the relation between performing BSE and caring/seriousness perception in line with meta-analysis procedures were used for meta-analysis in the present study and comparisons were made. There is difference between the perceptions of caring/seriousness of individuals performing and not performing BSE (*pooled SMD*=0.16, 95%CI 0.04-0.28, $p=0.007$). The caring/seriousness perception of those performing BSE had smaller effect size compared to those not performing.

Health motivation

A total of 5 studies investigating the relation between performing BSE and *health motivation* in line with meta-analysis procedures were used for meta-analysis in the present study and comparisons were made.

There is difference between *health motivations* of individuals performing and not performing BSE (*pooled SMD*=0.66, 95%CI 0.54-0.78, $p < 0.001$). *Health motivation* of individuals performing BSE had nearly moderate level of effect size compared to others not performing BSE.

Perceived barriers

A total of 5 studies investigating the relation between BSE barriers and performing BSE in line with meta-analysis procedures were used for meta-analysis in the present study and comparisons were made.

There is no difference between BSE barriers of individuals performing and not performing BSE (*pooled SMD*=-0.06, 95%CI -0.18-0.05, $p=0.285$). BSE barriers of individuals performing BSE had an important effect size compared to those not performing BSE.

Perceived benefits

A total of 5 studies investigating the relation between BSE benefits and performing BSE in line with meta-analysis procedures were used for meta-analysis in the present study and comparisons were made.

There is difference between BSE benefits of individuals performing and not performing BSE (*pooled SMD*=-0.52, 95%CI 0.40-0.64, $p < 0.001$). BSE benefits of individuals performing BSE had a moderate effect size compared to those not performing BSE.

Self-efficiency /adequacy

A total of 5 studies investigating the relation between

Table 2. Family History of Breast Cancer of Women Performing BSE

| First Author (year) | Case (BSE+) | Control (BSE-) | Study design | Odds ratio | 95% Conf. Interval |
|---------------------|-------------|----------------|--------------|------------|--------------------|
| Avci (2008a) | 23 | 80 | Case-control | 11.850 | 1.169-20.069 |
| Beydag (2007) | 61 | 139 | Case-control | 1.013 | 0.299-3.427 |
| Altunkan (2008) | 35 | 218 | Case-control | 1.348 | 0.515-3.528 |
| Avci (2008b) | 97 | 31 | Case-control | 1.303 | 0.261-6.489 |
| Karayurt (2008) | 32 | 68 | Case-control | 0.901 | 0.217-3.740 |
| Koc (2009) | 35 | 65 | Case-control | 1.187 | 0.357-3.949 |
| Ertem (2009) | 42 | 37 | Case-control | 0.868 | 0.201-3.747 |
| Guleser (2009) | 119 | 117 | Case-control | 0.390 | 0.144-1.054 |
| Ekici (2007) | 9 | 58 | Case-control | 35 | 5.089-240.701 |
| Gocgeldi (2008) | 198 | 103 | Case-control | 1.000 | 0.578-1.730 |
| Avci (2005) | 89 | 66 | Case-control | 1.250 | 0.287-5.426 |
| Aslan (2007) | 63 | 37 | Case-control | 1.031 | 0.280-3.790 |
| Avci (2007) | 12 | 20 | Case-control | 1.133 | 0.160-7.983 |
| Canbulat (2008) | 185 | 45 | Case-control | 1.079 | 0.385-3.026 |
| Cevik (2003) | 17 | 45 | Case-control | 1.163 | 0.263-5.134 |
| Harputlu (2005) | 41 | 120 | Case-control | 1.105 | 0.278-4.380 |
| Arsilan (2007) | 122 | 78 | Case-control | 1.024 | 0.322-3.253 |
| Secginli (2006) | 259 | 397 | Case-control | 1.926 | 1.169-3.173 |

*OR: Odds ratio. BSE+: Performing Breast Self-Examination. KKMM-: Not-performing breast self-examination

Table 3. Meta-Analysis

| First Author (year) | Case (KKMM+) | | | Control (KKMM-) | | | Study design | SMD | 95% Conf., Interval |
|---|--------------|-------|------|-----------------|-------|------|--------------|--------|------------------------|
| | n | mean | sd | n | mean | sd | | | |
| Observational Studies about Awareness | | | | | | | | | |
| Altunkan (2008) | 35 | 8.80 | 2.70 | 218 | 7.90 | 2.4 | Case-control | 0.368 | 0.010-0.726 |
| Karayurt (2008) | 32 | 9.28 | 2.67 | 66 | 7.78 | 2.57 | Case-control | 0.576 | 0.146-1.006 |
| Gercek (2008) | 138 | 7.70 | 2.05 | 95 | 7.90 | 1.68 | Case-control | -0.104 | -0.366-0.156 |
| Avci (2007) | 388 | 7.74 | 1.76 | 220 | 7.08 | 2.33 | Case-control | 0.332 | 0.166-0.498 |
| Canbulat (2008) | 218 | 8.66 | 3.02 | 50 | 7.32 | 2.07 | Case-control | 0.467 | 0.157-0.776 |
| Studies about Seriousness/Caring Perception | | | | | | | | | |
| Altunkan (2008) | 35 | 20.20 | 4.40 | 218 | 20.60 | 3.9 | Case-control | -0.1 | -0.457-0.256 |
| Karayurt (2008) | 32 | 25.81 | 4.75 | 68 | 23.70 | 5.29 | Case-control | 0.411 | -0.012-0.835 |
| Gercek (2008) | 138 | 19.43 | 5.43 | 95 | 18.76 | 5.54 | Case-control | 0.122 | -0.139-0.383 |
| Avci (2007) | 388 | 19.21 | 4.28 | 220 | 18.08 | 6.55 | Case-control | 0.216 | 0.050-0.382 |
| Canbulat (2008) | 218 | 16.58 | 4.40 | 218 | 20.60 | 3.9 | Case-control | 0.075 | -0.231-0.382 |
| Studies about <i>Health Motivation</i> | | | | | | | | | |
| Altunkan (2008) | 35 | 18.80 | 2.80 | 218 | 17.20 | 1.9 | Case-control | 0.782 | 0.418-1.145 |
| Karayurt (2008) | 32 | 19.31 | 3.23 | 68 | 16.18 | 3.59 | Case-control | 0.899 | 0.460-1.338 |
| Gercek (2008) | 138 | 19.39 | 7.23 | 95 | 19.06 | 7.03 | Case-control | 0.046 | -0.215-0.307 |
| Avci (2007) | 388 | 19.59 | 2.48 | 220 | 16.46 | 5.53 | Case-control | 0.808 | 0.637-0.980 |
| Canbulat (2008) | 218 | 21.01 | 3.49 | 50 | 17.80 | 5.05 | Case-control | 0.839 | 0.523-1.154 |
| Studies about BSE Barriers | | | | | | | | | |
| Altunkan (2008) | 35 | 20.00 | 4.10 | 218 | 24.80 | 3.5 | Case-control | -1.338 | -1.713-0.962 |
| Karayurt (2008) | 32 | 27.03 | 2.75 | 68 | 24.01 | 4.76 | Case-control | 0.714 | 0.282-1.146 |
| Gercek (2008) | 138 | 25.71 | 4.87 | 95 | 26.74 | 4.59 | Case-control | -0.216 | -0.478-0.045 |
| Avci (2007) | 388 | 21.11 | 5.59 | 220 | 18.69 | 6.65 | Case-control | 0.403 | 0.236-0.570 |
| Canbulat (2008) | 218 | 14.94 | 6.76 | 50 | 22.36 | 8.04 | Case-control | -1.057 | -1.378-0.737 |
| Observational Studies about BSE Benefits | | | | | | | | | |
| Altunkan (2008) | 35 | 15.50 | 1.60 | 218 | 10.00 | 2.3 | Case-control | 2.479 | 2.061-2.897 |
| Karayurt (2008) | 32 | 18.84 | 4.40 | 68 | 22.96 | 7.02 | Case-control | -0.652 | -1.082-0.222 |
| Gercek (2008) | 138 | 16.10 | 6.98 | 95 | 15.67 | 5.82 | Case-control | 0.065 | -0.195-0.327 |
| Avci (2007) | 388 | 16.63 | 1.83 | 220 | 15.46 | 4.12 | Case-control | 0.406 | 0.239-0.573 |
| Canbulat (2008) | 218 | 17.10 | 3.03 | 50 | 13.26 | 4.57 | Case-control | 1.14 | 0.818-1.462 |
| Observational Studies about Self-Efficacy | | | | | | | | | |
| Altunkan (2008) | 35 | 33.20 | 8.50 | 218 | 20.00 | 0.9 | Case-control | 4.076 | 3.571-4.580 |
| Karayurt (2008) | 32 | 42.84 | 7.61 | 68 | 37.96 | 5.06 | Case-control | 0.815 | 0.379-1.250 |
| Gercek (2008) | 138 | 31.85 | 9.81 | 95 | 26.40 | 5.6 | Case-control | 0.652 | 0.384-0.920 |
| Avci (2007) | 388 | 36.00 | 5.97 | 220 | 30.46 | 10.9 | Case-control | 0.681 | 0.512-0.851 |
| Canbulat (2008) | 218 | 38.92 | 6.82 | 50 | 32.70 | 9.59 | Case-control | 0.839 | 0.524-1.155 |

*SMD: The standardized mean difference (SMD), sd: standard deviation, n: sample size, BSE+: Performing Breast Self-Examination, KKMM-: Not-performing breast self-examination

performing BSE and self-efficiency/adequacy in line with meta-analysis procedures were used for meta-analysis in the present study and comparisons were made.

There is a difference between self-efficiency levels of individuals performing and not performing BSE (*pooled SMD*=-0.91, 95%CI 0.78-1.03, $p<0.001$). Self-efficiency of individuals performing BSE had a larger effect size than those not performing BSE.

Discussion

One of the fundamental roles of nurses is health education. The aim of this health education is to make individuals develop health protective and promoter behaviors. When nurses improve individuals with positive health behaviors, they must be aware of the models explaining human behaviors. In this study, it is determined that many studies have been implemented by nurses about BSE and *Health Belief Model* has been frequently used in the recent years. This model was developed in 1950s by psychiatrists working in public health services in USA. *Health Belief Model* was developed for breast

cancer screening in nursing in 1984 based on the Victoria Champion *Health Belief Model* and it was later revised in 1993, 1997 and 1999. This scale measuring the women's beliefs about BSE and mammography in terms of HBM was primarily developed for American women and later adapted for Jordanian, Korean, African-American and Chinese women. Three different Turkish adaptations of Champion's *Health Belief Model Scale* (CHBMS) were made in Turkey, as well (Gözüm and Avcı, 2003; Karayurt and Dramalı, 2003; Seçginli, 2003). The scale is a 42-item questionnaire consisting of six sub-dimensions. The scale has "sensitivity", "caring/seriousness" and "health motivation" sub-dimensions for evaluating individuals' perception about breast cancer and general health as well as "barriers", "benefits" and "self-efficiency/confidence" sub-dimensions related to BSE, and "benefits" and "barriers" sub-dimensions about mammography (Gözüm and Avcı, 2004; Çenesiz, 2007).

The sub-dimension of sensitivity perception about breast cancer consists of three items and indicates the personal risks perceived for breast cancer. Sub-dimension of seriousness about breast cancer is composed of seven items and signifies the level of personal threat perception for breast cancer. Sub-dimension of BSE benefits is composed of four items and signifies the perceived advantages of BSE. The subdimension of barrier perception for performing BSE consists of 11 items and indicates the *perceived barriers* for BSE. The confidence subdimension of performing BSE is consisted of 10 items and signifies the perceived personal adequacy for BSE application skills in detecting abnormal breast masses. *Health motivation* sub-dimension is composed of 7 items and signifies the personal knowledge and worries about their health condition (Hay et al., 2006; Çenesiz, 2007).

In the study, two different meta-analyses were performed. Primarily, 18 studies investigating the relation between performing BSE and family history of breast cancer were analyzed. Accordingly, it was determined that individuals having family history of breast cancer 1.25 times more frequently perform BSE (OR=1.25 %CI 0.90-1.73).

In literature, it is reported that individuals with family history of breast cancer see themselves under risk for breast cancer and believe in the importance of screening for early diagnosis of breast cancer (Powe et al., 2005). Family history of breast cancer makes individuals develop consciousness about the vital risks of the disease, show awareness for the disease and perceive the consequences of diseases as serious and life-threatening; therefore, individuals with family history of breast cancer perform BSE more frequently. This result is compatible with the findings in literature.

In addition, 5 studies performed with *health belief model* (Avcı et al., 2007; Altunkan et al., 2008; Canbulat and Uzun, 2008; Gerçek et al., 2008; Karayurt, 2008) were analyzed. Sub-dimensions of *health belief model* were reevaluated as meta-analyses.

In Perceived sensitivity subdimension, a significant difference was detected among the sensitivity levels of those not performing BSE (*pooled SMD*=0.29, 95%CI 0.17-0.40, $p<0.001$). The sensitivity of individuals

performing BSE [n2] had moderate effect compared to those not performing BSE. In the study carried out on breast cancer among Thai women, it was reported that 25% of 145 women perform BSE and the application rate of BSE is higher among women with higher sensitivity against breast cancer (Jirojwong and MacLennan, 2003).

In meta-analysis of perceived seriousness/caring subdimension, the seriousness/caring levels of women performing BSE was found different from those not performing BSE (*pooled SMD*=0.16, 95 % CI 0.04-0.28, $p=0.007$). The seriousness/caring level of women performing BSE had a small effect size compared to those not performing BSE [n3]. The perceived seriousness indicates the individual beliefs about the seriousness of the disease. It also includes the possible results of the disease like death, disability, social losses etc. (U. S. Department of Health and Human Services, 2005). In the meta-analysis, seriousness perception was determined to have smaller effect size than sensitivity. The model also indicates the importance of the expected health behaviors and seriousness perception; however, it is reported that cancer is known and perceived as a serious disease in many societies, which could restrict the individual seriousness perception among behaviors against cancer. The results of the present study support the findings in literature.

For this reason, it is suggested to consider the sensitivity and seriousness together. The concurrent evaluation of seriousness and sensitivity is known as "the perceived threat". It is reported in literature that a woman who knows the seriousness of the breast cancer and sees herself under risk of getting breast cancer is inclined to more frequently perform BSE, mammography and clinical examinations than another woman of the same age (Aydoğdu (Gordes) and Bahar, 2011). The previous studies emphasized the importance of personal BSE behaviors in breast cancer and especially sensitivity and barriers on this matter (Moodi et al., 2011).

According to *health belief model*, individuals sensitive to breast cancer and perceiving it as a serious health issue more frequently perform BSE as they more probably adopt the breast self-examination. This result is an important clue for health care providers planning health education on protecting breast health.

Similarly, in the investigation of *health motivation* subdimension of the scale, a difference was detected between *health motivations* of individuals performing and not performing BSE (*pooled SMD*=0.66, 95%CI 0.54-0.78, $p<0.001$). *Health motivation* of individuals performing BSE had nearly moderate effect size compared to those not performing BSE. In conclusion, women with higher *health motivation* were determined to more frequently perform BSE. Motivation is important for people to develop health behaviors, and it is also quite important to use certain incentives for these behaviors (calling via phone, e-mailing, sending letters, using media sources and peer groups). Nurses could raise awareness by using motivation agents for early diagnosis of breast cancer (Aydoğdu and Bahar, 2011).

In the investigation of *perceived benefits* subdimension, a difference was detected between *perceived benefits* of individuals performing and not performing BSE (*pooled*

$SMD=-0.52$, 95%CI 0.40-0.64, $p<0.001$). The *perceived benefits* of individuals performing BSE had a moderate effect size compared to those not performing BSE. The perceived benefit is to reduce risk of getting breast cancer with the developed behaviors. The perceived benefit is also a determinant factor for whether individual is open to adopt health behaviors. The previous studies reported that the *perceived benefits* of women regarding early diagnosis methods for breast cancer include the provision of easier treatment opportunities with early diagnosis, reducing mortality due to cancer, detection of mass in the early phase, a chance for recovery, sustaining health status and living a long life. In a study carried out on female students in Iran, it was reported that the *perceived benefits* and knowledge significantly increased after education program about breast cancer (Moodi et al., 2011).

In the investigation of the *perceived barriers* subdimension, no difference was detected between *perceived barriers* of individuals performing and not performing BSE (*pooled SMD*=-0.06, 95%CI-0.18-0.05, $p=0.285$). The *perceived barriers* of individuals performing BSE did not have an important effect size compared to those not performing BSE. BSE barriers determine internal and external barriers perceived related to breast self-examination. If people do not adopt positive health behaviors despite their belief in the efficiency of protective behaviors, this could be caused by some barriers. The knowledge levels of individuals about health and diseases could allow them to understand the effects of health protective behaviors on life time and quality and to develop positive health perceptions and self-responsibility of health and thus reducing the barriers (Eroğlu and Kılıç, 2011). The women's *perceived barriers* regarding early diagnosis of breast cancer include the lack of doctor recommendation, lack of knowledge, shame, pain, cost, lack of time, fear of receiving radiation, finding process unnecessary, fear of facing a bad result, cultural values and beliefs. The most important variable preventing adoption of health protecting behaviors is the difference between *perceived barriers* and benefits. If the perceived sensitivity, seriousness and benefits reduce the effects of *perceived barriers*, the positive behavior will occur. Further studies should be carried out about the barriers to perform BSE for diagnosis of breast cancer in Turkey, and the results should be compared with study findings in other countries and cultures.

In the investigation of *Self-efficiency (adequacy)* subdimension, a difference was detected between self-efficiency levels of individuals performing and not performing BSE (*pooled SMD*=-0.91, 95%CI 0.78-1.03, $p<0.001$). The self-efficiency levels of individuals performing BSE had a big effect size compared to those not performing BSE. Beliefs regarding breast cancer and perception for the success of previous health behaviors, namely the self-efficiency/adequacy are effective on individual's performance of BSE for early diagnosis of breast cancer, and enable starting and maintaining this behavior. Jirogwong and MacLennan (2003) reported that women with high self-efficiency perception perform BSE by 4.6 times more frequently than women with low self-efficiency perception. Repetitive behaviors,

other's experiences, verbal convincing and physiological situations are effective factors on self-efficiency. As a result of the meta-analysis, the self-efficiency of individuals performing BSE was determined to have a larger effect than others not performing BSE (Jirogwong and MacLennan, 2003).

In conclusion, nurses should use current health promotion models and *health belief model* including factors affecting applications for early diagnosis of breast cancer by adapting them to cultures, and should also improve awareness and seriousness perceptions for model, increase the benefit perception, encourage behaviors promoting self-efficiency, and plan health educations, healthcare and activities for problems encountered. In addition, meta-analysis studies should be carried out to obtain highly persuasive data about breast cancer and care and the results should be compared with the findings in other countries and reflected on nursing applications.

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