MINI-REVIEW

Application of Health Behavior Theories to Breast Cancer Screening among Asian Women

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Abstract

Background: Although breast cancer is a major public health worry among Asian women, adherence to screening for the disease remains an obstacle to its prevention. A variety of psycho-social and cultural factors predispose women to delay or avoidance of screening for breast cancer symptoms at the early stages when cure is most likely to be successful. Yet few interventions implemented to date to address this condition in this region have drawn on health behavior theory. Materials and Methods: This paper reviews the existing literature on several cognitive theories and models associated with breast cancer screening, with an emphasis on the work that has been done in relation to Asian women. To conduct this review, a number of electronic databases were searched with context-appropriate inclusion criteria. Results: Little empirical work was found that specifically addressed the applicability of health theories in promoting adherence to the current breast cancer prevention programs Among Asian women. However, a few studies were found that addressed individual cognitive factors that are likely to encourage women's motivation to protect themselves against breast cancer in this region of the world. The findings suggest that multi-level, socio-cultural interventions that focus on cognitive factors have much promise with this issue. Conclusions: Interventions are needed that effectively and efficiently target the personal motivation of at-risk Asian women to seek out and engage in breast cancer prevention. Concerning implications, personal motivation to seek out and engage in individual preventive actions for breast cancer prevention among Asian women is a timely, high priority target with practical implications for community development and health promotion. Further studies using qualitative, anthropologic approaches shaped for implementation in multi-ethnic Asian settings are needed to inform and guide these interventions.

Keywords: Breast cancer screening - health behavior theories - Asian women

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Introduction

In Asian countries, breast cancer is the most frequently diagnosed cancer among women. The National Cancer Registries for Asian countries stated that the crude occurrence rate of breast cancer fluctuated from 21.3 per 100,000 population in Jordan, 21.4 in Iran, 24.1 in Turkey, 34.86 in Malaysia, 48 in Japan to 54 per 100,000 population in Singapore (Ferlay et al., 2000; Petro-Nustus and Mikhail, 2002; Harirchi et al., 2004; Hisham and Yip, 2004; Secginli and Nahcivan, 2006). The increase in breast cancer mortality for middle-aged women from the mid-80s to the mid-90s was the highest in Korea, followed by China, then Japan (Bray et al., 2004).

Ahmadian and Abu Samah (2012b) have concluded based on previous studies that the greatest prevalence of breast cancer most often strikes Asian women of age between 40 to 49 years-old compared to women in Western countries, where the highest prevalence affects women between 50 to 59 years. For example, more than half of new cases of breast cancer were diagnosed in women under the age of 50 years in Singapore (Yip and Ng, 1996), Pakistan (Usmani et al., 1996), Thailand (Thongsuksal and Sripung, 2000), Malaysia (Hisham and Yip, 2004), Iran (Harirchi et al., 2004), and Arab women in Palestine (Nissan et al., 2004).

Furthermore, breast cancer screening such as mammography utilization in Asian countries is also low. Less than 10.3% of women in the United Arab Emirates had mammography and only 25% of Turkish women have mammogram, which was as a result of inadequate knowledge of screening and insufficient offering of screening by health care workers (Schwartz et al., 2008). Likewise, previous studies have shown that only 12% in South Asia (Choudhry et al., 1998), 6% in China (Fung, 1998), 6% in Iran (Jarvandi et al., 2002), 7% in Jordan (Petro-Nustus and Mikhail, 2002), and 1 3.8% in Malaysia (Hisham and Yip, 2004), women performed breast self-exam regularly, compared to Sweden where 70% of women aged 25-80 years examined their breasts on a regular basis (Persson et al., 1997).

Literature has shown that breast cancer screening

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behaviours among Asian women residing in their native countries are also low compared to the Asian women in Western countries (Ahmadian and Abu Samah, 2012b). This may be as a result of socio-cultural variation in Asia which causes non-adherence to breast cancer screening, which in turn makes breast cancer screening programs not successful due to lack of women's participation in those activities.

While randomized assessments on mammography comparison with no mammography screening revealed that women might benefit a 15% relative risk decrease in mortality from mammography (Gotzsche and Nielsen, 2006). It is apparent that potential cognitive factors affecting breast cancer screening methods such as mammography should be given more consideration in order to reduce the number of advanced stage tumors.

There are many cognitive factors or psycho-social factors related to breast cancer screening which may help in designing behavioral interventions for promoting women's seeking behavior on breast cancer prevention. However, barriers to breast cancer screening are also associated to age, culture, income, knowledge, education, occupation, language barriers, and immigration condition. We also believe that the effectiveness of cognitive factors related to health theories and models have not been applied to understand adherence behavior to breast cancer screening strategies among Asian women.

Numerous breast cancer intervention programs have been conducted to expand screening adherence, however only few social-cognitive theories of health explain the processes those cancer intervention programs. Nevertheless, previous studies showed that remarkable progress has been achieved in exploring the determinants of individual's health-related behaviors to enhance positive changes.

The value of theory in clarifications of behavior is relevant in the development of health-promoting interventions, and in decoding research into practice Pasick and Burke (2008). By far, the most frequently used theories in health education are; Health Belief Model (Hockbaum, 1958; Rosenstock, 1966), Social Cognitive Theory (Bandura and Adams, 1977), Theory of Reasoned Action and Theory of Planned Behavior (Fishben and Ajzen, 1975), Trans theoretical Theory (Prochaska, et al., 1994) and Health Promotional Model (Pender, 1987) which have been documented by Eun-Ok Lee (2001).

On the same note, Pasick and Bruke (2008) pointed that the most often used theories regarding mammography screening are; Health Belief Model (HBM) (Hockbaum, 1958; Rosenstock, 1966), Transtheoretical model (TTM) (Prochaska, 1991; 1994), the Theory of Planned Behavior (TPB) (Ajzen, 2005), Social Support Theory (Heaney and Israel, 1997; House et al., 1998), Social Cognitive Theory (SCT) (Bandura, 1986), and PRECEDE-PROCEED (Green and Kreuter, 2005). While the most frequently employed theories are those within the cognitive perspective and the transtheoretical model (Leventhal and Cameron, 1987; Brawley and Culos-Reed, 2000; Redding et al., 2000; Munro et al., 2007).

On the basis of this review, we aimed to acknowledge the current health behavior theories which explain breast cancer screening behavior among Asian women. We reviewed some studies which addressed three methods of screening for breast cancer among Asian women. However, it was only factors affecting adherence to breast cancer screening methods were considered in this study. Based on that, we emphasize on some selected cognitive or psycho-social factors which are relevant to individual preventive actions for breast cancer. These factors individually and collectively have implications to implementation of effective preventive actions such as early interventions which encourage routine breast cancer screening among Asian women.

Materials and Methods

This study is approached from a content analysis perspective to recognize cognitive or psycho-social factors influencing breast cancer screening among Asian women. From 1985 to 2012 more than 80 journal articles were reviewed by Pub Med, Medline, Science Direct, and Google Scholar. The inclusion criteria were "health behaviour theories", "breast cancer screening", "cognitive factors", "psycho-social factors" and "Asian women". Additional investigation was performed using these keywords such as models or theories with health behaviour, and adherence, attendance or compliance along with the breast cancer screening.

In outlining the factors, there are many behavioural, psycho-social, and cognitive constructs which impact on Asian women's adherence to breast cancer screening. But this review tends to focus on the current published studies in combination with cognitive factors whether individual or social for the purpose of cancer prevention education. The primary assumption is that these potential factors should be understood in terms of future sustainable breast cancer prevention programs for community development practice in public health. Similar to most researches on health behaviour theories and public health issues; individual cognitive factors dominate breast cancer screening issue among Asian women.

Health Theories and Breast Cancer Screening

There are many health theories or models that explicate the different aspects of health-related behaviors. We believe that the most frequently cited theories in studies of breast cancer screening in Asian countries are *i*) Health Belief Model (Hockbaum, 1958; Rosenstock, 1966), *ii*) Social Cognitive Theory (Bandura and Adams, 1977), *iii*) Theory of Reasoned Action and Theory of Planned Behaviour (Fishben and Ajzen, 1975). These theories were applied to many researches whether individually or in combine with each other.

Health belief model

The 'Health Belief Model' (Hockbaum, 1958; Rosenstock, 1966) is a psychological and prominent model which has been commonly used in health behavior researches among different ethnic groups in Asian countries. This model was developed in the 1950s by social psychologists named Hochbaum, (1958);

Rosenstock, (1960) and Becker, (1974) who were then working in the U.S. Public Health Services.

The severity of a potential illness, the person's susceptibility to that illness, and the benefits of taking a preventive action, and the barriers to taking that action are four important constructs in the model (Hochbaum, 1958; Rosenstock, 1960). The model also includes cues to action as an important component in maintaining patterns of behavior (Becker, 1974). In fact, the health belief model attempts to predict health-related behavior with emphasis on one's beliefs. Many studies have noted that the health belief model components are reliable to explain human health behavior (Champion, 1992; Choi et al., 2001). Over the past three decades, this model has become one of the highly utilized approaches in understanding women's participation in breast cancer screening. The health belief model has also been widely studied by many researchers and authors to investigate women's behavior in mammography screening (Thomas et al., 1996, Miller and champion, 1997).

Furthermore, Poss (2001) mentioned that significant beliefs allow an improved understanding of the cultural perspective influencing the people's behaviour. Several researchers have also reported that there is a significant relationship between women's beliefs and breast cancer screening, such as mammography (Sheeran, 2002; Ajzen et al., 2004). For breast cancer screening such as mammography, beliefs refers to knowing the time and the place of screening and other information like setting up for work leave and transportation are factors that will increase the mammography usage among women (Gollwitzer, 1993; Rutter e al., 2006). For instance, in Asian countries such as Korea (Han et al., 2000) and Turkey (Secginli and Nahcivan, 2006), Iran (Ahmadian et al., 2010b), the belief in the benefit of screening among women are positively associated with early detection behaviors. In contrast, Asian women who always adopt a lower position which can result to lack of beliefs in the benefit of early detection ignore their health care needs (Benner et al., 2002; Im et al., 2004; Nissian et al., 2004; Hisham and Yip, 2004).

Sometimes beliefs can be tailored by other factors. For example, in a study of Vietnamese American women, mostly from first generation immigrants, demographic and acculturation factors demonstrated a high correlation with breast cancer screening instead of beliefs (McPhee, 1997). Some socio-cultural beliefs such as touching of breasts by the technician, living longer, and X-ray exposure are also efficient in doing mammography (Motano et al., 1997). Similarly, cultural and religious beliefs have associated with breast cancer screening (e.g. mammography utilization) among Iranian women (Ahmadian, 2011). In a similar vein, with regard to clinical breast exam in Tehran, although, majority of the women wished to be examined by a female physician, about 47% of women also stated that clinical breast exam by a male physician was not against their Islamic beliefs. The results also showed majority of the women said that breast self-exam was not against their religious beliefs (Montazeri et al., 2003). Thus, religious beliefs among Asian Muslim women are crucial to the breast cancer early detection.

Other cross-sectional study among Muslim women in Iran showed that the adherent women to mammography had more positive beliefs in doing screening than the non-adherent group. Focus group discussions showed that most Iranian women are not interested in those practices that require their bodies be touched by physicians, so breast cancer screening practices usually ignored by women (Ahmadian, 2011). The results of other study in Kerman, Iran also demonstrated that the health belief model dimensions, such as perceived benefits and the presence of cues to action in mammography use, is associated with having mammography (Abbaszadeh et al., 2007).

As we have shown, the health belief model was a well-regarded theory for many studies related to breast cancer screening behaviours. This theory reflects the dynamic nature of interaction between benefits and barriers to health seeking behaviour. In fact, individual's evaluation on the benefits of preventive care should measure against their perceived barriers and cost of taking action.

Previous literature proved that in trying to enhance breast self-examination practices among women, it seems that the threat of breast cancer would persuade women to accept early detection but there are some barriers to performing the breast self-exam which might have a superior influence on the behaviour (Champion, 1993; Champion and Menon, 1997; Umeh and Rogan-Gibson, 2001). Some of these barriers include difficulty with starting a new behaviour or developing a new habit, fear of not being able to perform a desired behaviour and embarrassment (Umeh and Rogen-Gibson, 2001).

Researchers have also shown that increased benefits and decreased barriers are linked to increased screening (Slenker and Grant, 1989; Champion, 1992; Rakowski et al., 1992). A survey in Iran also revealed that non-adherence with mammography was associated with high levels of distress among women which ends in being unable to overcome their problems on taking mammography. Although, the study highlighted that participating women are advantaged by socio-demographic characteristics, it is believed that respondents in lower socioeconomic classes has more barriers to screening (Ahmadian et al., 2011). Samah and Ahmadian (2012) also stated that a higher education level, a middle income level, and a positive family history of breast cancer were potential predictor variables of mammography participation and decreases psycho-social barriers among Iranian women.

The most significant construct of the health belief model is the perceived barrier that determines behavior change (Janz and Becker, 1984). It involves individual's own estimation of the obstacles in his or her way to adopt a new behavior. The socio-cultural barriers such as patient-physician communication difficulties, beliefs about cancer, and cancer prevention influence women's involvement in breast cancer screening programs. Previous studies revealed that physicians are less likely to share information with individuals who differ from them by social class, ethnicity, gender, and age (Meleis and Hatter-Pollard, 1995; O' Malley et al., 1997).

Similarly, health care professionals also have stereotypical ideas about Muslim women as being powerless, uneducated and subservient (Meleis and Hatter-Pollard, 1995). Rashidi and Rajaram (2000)

showed that the unique complexities in the socio-cultural backgrounds of Asian Muslim immigrant women could also delay access to healthcare services. Communication problems also exist due to religious, cultural and linguistic differences between older Asian Muslim women and their physicians. Although there is little information about the cancer screening behaviour of Muslim women, modesty has also been concerned in these communities (Rashidi and Rajaram, 2000).

Likewise, findings of many studies showed that women were fearful about cancer and death which make them reluctant to participate in breast cancer screening (Bener et al., 2002; Juon et al., 2004; Nissan et al., 2004). Taking no care of oneself, lack of information, and fear are the three most commonly cited barriers (Garbers et al., 2003). Barriers in the case of mammography could include fear of cancer, pain, cost, travel and time (Champion and Menon, 1997). On similar account, previous studies highlighted barriers to screening behavior including fear of results, fear of treatment and fear of the test itself. These studies include countries such as, Iran (Jarvandi et al., 2002), Malaysia (Hisham and Yip, 2003), United Arab Emirates (Bener et al., 2002) and Jordan (Petro-Nustas and Mikhail, 2002).

Smith et al. (2006) also investigated that language barriers, fatalism, fear, and preference for traditional healers are barriers to breast cancer screening. Lack of time and costs were the most frequently reported reasons for Chinese women's reluctance to participate in clinical breast examinations or mammography screenings in Hong Kong (Chua, 2005). Physical examination of body parts is a barrier to screening for Asian women. This barrier includes a woman's concern for maintaining her own expectations of modesty and attitudes of her male sexual partner. However, one reason for low participation rate in mammography among Asian women was their inability in perceiving the importance of breast cancer screening test (Parsa et al., 2006). Even for health issues, women have to rely on doctors or health care professionals' advice (Ahmadian et al., 2012a).

In Asian traditional culture, women are unwilling to show their breasts to others, including to health care providers (Im et al., 2004; Juon et al., 2004; Smith et al., 2006). Sometimes unpleasant previous experiences stresses the modesty issues of the Korean, Chinese, and Iranian women further (Abdullah and Leung, 2000; Im et al., 2004; Juon et al., 2004). Male physicians also do the clinical exams in Asian countries which needs women expose their breasts to them. Thus, they feel ashamed and as a result they do not tend to undergo a stressful screening. A study by Ahmadian et al. (2011) identified barriers that may have an impact on women's adherence to mammography in Iran. Majority of women admitted embarrassment, lack of doctor or health care provider's advice regarding mammography, and worry about mammogram devices as the most selective barriers.

Additionally, Asian immigrants are more disadvantaged and faced with numerous barriers in accessing health care than non-immigrant minority women. Cancer screening barriers include: cost, particularly for undocumented immigrants, lack of female physicians, women's lower status and men's gate keeping, transportation and language barrier (Crane et al., 1996). Latina, Chinese, and Vietnamese American women who were born outside the United States were significantly less likely to have mammography compared to white women (Hiatt, 1996). It seems that the lack of knowledge is a barrier to regular cancer screening for minority women related to Asian communities.

Some studies suggest that having a gynaecologist, as a regular physician, and physician referral are important predictors in mammography (Jarvandi et al., 2002; Im et al., 2004; Juon et al., 2004; Secginli et al., 2006). Also, the rate of referral by a physician was substantially higher among participating women in mammography. In some Asian countries such as Iran, Turkey, and Korea insurance for having mammography requires doctor's reference to ensure payments (Jarvandi et al., 2002; Juon et al., 2004; Secginli et al., 2006; Parsa et al., 2006; Ahmadian and Abu Samah, 2012b).

Generally women who had been screened before cited fear, pain, or other attitudinal barriers more often, but women who had never had been screened cited cost or other logistical barriers. Thus, attention to individual perceptions of self efficacy and perceived barriers influence health care decisions and should be taken into account for health education.

Theory of reasoned action

The second theory used for this study is the theory of reasoned action which was formulated by Ajzen and Fishbein in 1980. The theory of reasoned action suggests that a person's behavior is defined by his/her intention to the behavior. Fishbein and Ajzen also examined ways to predict behavior and outcome. They accepted that individuals are usually quite rational and they first adopt useful information and consider the implications of their actions before they decide to take on or not to take on in a given behavior (Ajzen and Fishbein, 1980).

The theory of reasoned action has been used by many social researchers to interpret individual's behaviors (Gillmor et al., 1994; Bosompra, 2001; Selvan et al., 2001; Trost et al., 2002). However, previous study explained low association between attitudes and behavior (Trost et al., 2002). Whereas, some authors have found that subjective norm was a significant factor of behavioral intention (Smith, and Biddle, 1999; Bosompra, 2001). For example, women who did not adhere to screening guidelines for breast self-exam or clinical breast exam reported less social support (Katapodi et al., 2002).

As studies shown, women in Korea (Lee et al., 2000; Im et al., 2004), Malaysia (Hisham and Yip, 2003), Iran (Jarvandi et al., 2002), and Singapore (Straughan and Seow, 2000), did not view the importance of early detection, and this influences their attitude and intention towards breast cancer screening. However, social influence is a significant contributor of behavioral intention in health issues (Smith and Biddle, 1999; Bosompra, 2001). Regarding breast cancer screening, Allen et al. (1998) have reported that social influence was significantly associated with mammography intention in women.

Previous literature also showed, if the social network

including the employers, colleagues in the workplace, family members, and friends, is being improved through appropriate health education campaign, then it is likely that more positive attitude toward preventive health behavior will be observed among women (Abdullah and Leung, 2000; Straughan and Seow, 2000; Juon et al., 2004).

Kim (2002) combined the health belief model and the theory of reasoned action to investigate women's participation in mammography screening in Korea. Likewise, supportive social influences along with self-efficacy were found to be strongly linked to mammography intention adjusting for prior mammography use (Allen et al., 1998). In contrast, a recent study in Iran demonstrated that women participating in mammography have lower social influence compared to non-participating group (Ahmadian, 2011).

Researchers have also concluded that intention or attitude toward mammography is also an important factor for low participation rate among Asian women (Rashidi and Rajaram, 2000; Hisham and Yip, 2003). Attitudes toward mammography are also increased by women's beliefs about the expected outcomes resulting from the screening performance. Attitude is about personal belief concerning the perception of what they should do regarding breast cancer which eventually approved their action to seek treatment or early detection. Cultural and social characteristics are very imperative factors for women's participation in breast cancer screening and their intention. For example, modesty was stated to be an inhibiting issue that influenced women's participation in mammography (Im et al., 2004). A focus group discussion in Iran showed that religious boundaries, fatalism, and modesty inversely affect the performance of breast cancer screening among Muslim women (Ahmadian, 2011). In addition, destiny is a strong motive for diseases such as breast cancer. Death is assumed as God's will by most Iranian women, especially among the traditional ones and this negatively affects their attitude towards health seeking behaviours.

In some Asian countries, culturally norms or taboos inhibit the discussion of particular issues, such as gynecological problems or cancer disease. Similarly, Iranian women do not tend to talk about cancer disease, as they believe breast cancer affect their body and attractiveness. So, participating women could not benefit from the information which has been circulating in their social network. On the other hand, most women who have participated in mammography in the past two years have indicated that their mammography was diagnostic. It can be concluded that there is resistance against family or friends' advice regarding mammography use and as a result they were less influenced by social factors.

With regard to Muslim women, Rajaram and Rashidi (1999) pointed out that Muslim men inappropriately use Islam to justify their authority and dominance over their spouses which creates another barrier for breast cancer screening. Usually, an expectation of obedience to spouse who exerts control over family health decisions is in conflict with the expectation of remaining healthy in order to serve the needs of the family.

Furthermore, many studies have reported the positive influence of social support on women's psychological well-being through every stage of breast cancer (Hoskins et al., 1996; Lugton, 1997). Emotional support is offered by family members in the form of trust, concern, and listening and instrumental support such as money, time, labour, and transportation. Peers provide appraisal support that increases the individual's self-esteem. Information support includes advice, suggestions, information, and directives (Gotay and Wilson, 1998).

Previous literature also showed the relationship of social network with higher income and higher education. Women who did not adhere to screening guidelines or breast self-exam or clinical breast exam admitted less social support from their network (Katapodi et al., 2002). Influence of family, friends or someone with breast cancer is significant for participation in screening (McCance et al., 1996). Besides, other researchers reported that lack of encouragement by family members and physicians leads to low participation in breast cancer screening (Han et al., 2000).

Social network, including employers, colleagues in the workplace, family, and friends can impact on women's intention toward preventive behavior (Straughan and Seow, 2000; Abdullah and Leung, 2000; Juon et al., 2004). In addition, a recent study in Iran revealed that women who performed mammography had adequate knowledge on breast cancer provided by advocates, work place health promotion programs, or public health centers at the district level (Ahmadian et al., 2010a). It is clear that health is an ecological concept that requires proper tactic to promote it at the individual and environmental levels. Throughout, we take note of correlation between behavior and intention regarding breast cancer screening while applied components in this theory are attitude and social influence.

Social cognitive theory

The third theory used for this study is Social Cognitive Theory (Bandura and Adams, 1977). Bandura's theory of self-efficacy which one can successfully execute the behavior required to produce the outcome, holds that self-efficacy expectancies serve as a primary mechanism guiding social behavior. Self-efficacy is the belief in one's own ability to do something (Bandura and Adams, 1977). But the influence of self-efficacy measures on behavior has been strengthened when related to specific domains, rather than globally measured (Strecher and Rosenstock, 1997).

The component of self-efficacy is related to individual's faith in his or her ability to participate in specific behaviors which was added to health belief model in order to improve this model's power to explain people's behavior (Rosenstock et al., 1988). They believe that psychological factors influence women's participation in an intervention realistically.

With regard to Asian women, Shirazi et al. (2006) also revealed that majority of women lacked confidence and admitted that they did not perform breast self-exam. In addition, a significant positive relationship has been discovered between breast self-exam and self-efficacy

(Edgar et al., 1984; Brailey, 1986). Self-efficacy was positively associated with attendance at the breast screening exercise (Straughan and Seow, 2000). Self-efficacy was also considered to be a significant variable for mammography screening (Savage and Clarke 1996; Lechner et al., 1997; Allen et al., 1998; Wallace, 2002). Similarly, Kim (2000) argued that, Korean American women who did not laid emphasis on mammography had lower self-efficacy for having a mammogram.

Bandura and Adams (1977) observed that low self-efficacy shows avoidance behaviour among people and in reverse, high self-efficacy tends to result in initiating behaviours and high efforts to overcome personal obstacles like fear. Along with early detection, there must be adequate self-efficacy to challenge the psychosocial obstacles. In contrast, most women seemed to believe in the efficacy of breast self-exam, they did not do it easily (Shirazi et al., 2006). A survey in Iran showed that the adherent group to mammography had greater self-efficacy than the non-adherent one (Ahmadian et al., 2012c). However, researcher also found that mammography screening was related to higher self-efficacy and women's occupation. But self-efficacy has no significant relationship with mammography adherence in Kerman, Iran (Abbaszadeh et al., 2007).

These examples are representative of the social cognitive theory and self-efficacy as a factor which has a critical effect on an individual's engagement in breast cancer screening. Within health context, particularly in the case of breast cancer prevention, individuals (women) are the frontline in prevention, care, and support attempts. In fact, if women do not tend to experience breast cancer screening, any effort to recruit them for early cancer detection will be fruitless (Ahmadian and Abu Samah, 2012a).

Discussion

In order to improve public and individual health, engaging the community is a crucial component of epidemiological, public health and community development research. Our knowledge about the role of women in the response to breast cancer prevention and multifaceted interventions remains incomplete. Furthermore, many interventions that target Asian women result in limited improvements in durability. Recognizing the different psycho-social and cognitive factors which reflect socio-cultural conditions of women is critical for raising a valuable response.

This review has been done to recognize psycho-social or cognitive factors which affect women's engagement or participation in breast cancer screening. This paper also reviewed three widely used health behavior theories to explain the different factors influencing breast cancer preventive behaviors among Asian women.

We deem this argument shows psycho-social or cognitive factors make disproportion in the breast cancer early detection rates among Asian women. As shown earlier, there are some individual factors such as belief, attitude, self efficacy, social influence, and perceived barriers were dominant in relation with breast cancer screening methods in Asian countries. However, women's involvement in the diagnosis process also affects women's participation in the breast cancer activities at the community level (Ahmadian et al., 2012b).

Based on this review and our previous recent review on factors influencing breast cancer screening among Asian women, we also find out survey study design and descriptive studies were often used to identify determinants which predict individual health promoting behaviors regarding breast cancer prevention (Ahmadian and Abu Samah, 2012b). It is obvious that there is a lack of community-based participatory research or qualitative studies regarding breast cancer prevention among Asian women. Future researchers should try to describe an empirical framework which provides broader discussions of women and health care professionals and their engagement in breast cancer prevention programs and activities.

Breast cancer is a prevalent disease in Asian countries, therefore, recommendations on breast cancer screening, and its intervals must be made clear to women. Active recruitment strategies and educational programs also affect on women's participation in breast cancer screening, particularly mammography. Women's awareness concerning breast self-examination and physical examination must be considered in screening protocols in younger women to further promote breast cancer screening methods (Ahmadian and Abu Samah, 2012b). In order to achieve this, healthcare professionals have a vital role in encouraging women to adjust their individual behaviors regarding breast cancer prevention.

One of limitations of this mini-review is that we did not deliberate all theories used to understand breast cancer screening behavior among Asian women. Further, the three theories used in this research explained specific psycho-social or cognitive factors which affect women's behavior individually. Nonetheless, the individual participation in preventive health practices (e.g. mammography, breast self-examination) is the core component of community participation in breast cancer prevention programs (Ahmadian and Abu Samah, 2012a).

Conclusion

This review is an account of the contribution of cognitive or psycho-social factors influencing breast cancer early detection with the work done by previous scholars and researchers. As we have shown, the theories used in the study take into account individual factors relating to breast cancer screening methods among Asian women. Even though, fundamental studies in breast cancer prevention and control within the above mentioned factors or theories are still incomplete. Another actual problem is that, so far, the recent studies focusing on these theories will not be translated into practice within long-term breast cancer screening programs.

The implication of this study for practice call all health care organizations, national cancer councils, cancer programming and research institutes, and advocates in Asian countries to adapt interventions based on relevant cognitive factors which help to reduce the breast cancer

disease. Additionally, this mini-review underlines the need for investigation of socio-cultural context in support of community-based prevention programs and early intervention plans suited for multi-ethnic communities and societies in Asia.

This study will also contribute to health promotion and community development by the protective effects of women's engagement in cancer prevention for breast cancer programs. Participation in breast cancer prevention efforts among women can result in both improved women's health, but also contribute greatly to secondary prevention efforts.

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