

THE THEORETICAL FRAMEWORK OF HEALTH BELIEFS ON THE STAGE OF BEHAVIORAL ADOPTION OF BREAST SELF-EXAMINATION AND MAMMOGRAPHY SCREENING

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ABSTRACT

Background: Breast cancer is one of the leading causes of cancer death amongst women and survival rates could be improved with early detection and access to optimal treatment. However, in Malaysia breast screening facilities were still underutilized. This study aimed to review behavior change theories that are applicable in formulating a theoretical framework to help design more effective interventions in promoting breast self-examination (BSE) and mammography screening amongst Malaysian women. **Methods:** Several electronic databases were searched for existing theories or models of behavior change associated with breast cancer screening. The relevant theories found included the health belief model (HBM), the theory of planned behavior (TPB), the trans-theoretical model (TTM), the theory of care seeking behavior (TCSB), the protection motivation theory (PMT) and the social cognitive theory (SCT). The theories were then reviewed for the appropriateness of constructs as well as for interrelated concepts in understanding the behavior of women to participate in breast cancer screening practices. The constructs in each theory were traced to its synonymy and points of overlap before integrating those theories. **Result:** Analysis of the theories indicated that they have the potential to improve understanding of the stage of behavioral change to adopt BSE and mammography screening amongst women. Thus, a theoretical framework integrating the theories has been developed to garner more operative ways to influence and change women's behavior by studying the correlations between constructs in the framework. **Conclusion:** As there is evidence of the effectiveness of developing interventions based on social and behavioral science theories, it is then expected that this theoretical framework could help future researchers in preparing intervention programs towards enhancement of breast cancer screening behavior.

KEYWORDS: Theoretical framework, health behavior theories, breast cancer, breast cancer screening, breast self-examination, mammography screening

INTRODUCTION

Early detection and access to optimal treatment are the two most important determinants of survival from breast cancer (Yip et al., 2014; Kong et al., 2017). In Malaysia, women generally have poor survival from breast cancer. It was found that Malay women have poorer survival rates compared to the Chinese and

Indians (Yip et al., 2014; Nordin et al., 2018). The survival rate depends largely on the stage at diagnosis in which the best survival (81.7%) is at stage 1 which could further be improved to 90% or more by adopting early breast cancer detection practices (Yip et al., 2006). Presently, Malaysian women especially Malay women present with late stages of breast cancer due to lack of awareness as well as low uptake of breast self-examination (BSE), clinical breast examination (CBE) and mammography screening (Yip et al., 2014). Although BSE, CBE and mammography are believed to be suitable and efficient ways to ensure breast cancer can be detected earlier (Rosmawati, 2010; Parsa et al., 2011) nevertheless, breast screening facilities in Malaysia are still underutilized due to the lack of breast cancer awareness (Dahlui et al., 2011).

Awareness of breast cancer would aid in early detection and hence reduce the stage at diagnosis. This in turn aids to improve the likelihood of survival and cure (Kanaga et al., 2011). Even though cancer awareness campaigns conducted in the last five years in Malaysia focused mostly on breast cancer, there are no reports of its' effectiveness (Loh et al., 2017). It is indicated that many incorrect beliefs concerning breast cancer persist even with an excellent effort to improve breast cancer awareness and education (Burhans, 2018). Therefore, women need to be assisted to clear any misconceptions about breast cancer screening so that the benefits of early detection methods and timely treatment are well understood (Parsa et al., 2011). Further, personal beliefs and knowledge pertaining to early breast cancer detection can drive health-related behaviors that will influence the decision in seeking medical care (Burhans, 2018).

Health beliefs and attitudes are the two main factors indicated by researches that can affect the decision of women to be screened for breast cancer (Erbil & Bolukbas, 2014; Akhtari-Zavare et al., 2015). This fact was proven in Asian countries such as Korea, Turkey and Iran in which, women's perceived benefits of screening were positively related to early detection behaviors and the lack of it resulted in them ignoring their health care needs (Ahmadian & Samah, 2013). A body of evidence convincingly indicates that culturally-based attitudes and religious beliefs play an important role in defining women's screening behaviors (Kwok et al., 2015). Arab women for example believe that health and illness are determined by the will of God (Donnelly et al., 2013; Kwok et al., 2015). Similarly, many Chinese women believed that screening measures are meaningless and their destiny will not change if they were fated to have cancer (Kwok et al., 2015; Shang et al., 2015). The low rate of participation amongst Asian women in mammography for example, is attributable from their intention or attitude and these attitudes are possibly enhanced by their beliefs about the foreseeable outcomes from the screening accomplishments (Ahmadian & Samah, 2013).

Understanding Malaysian women's health beliefs regarding breast cancer screening behavior will help health care professionals choose more effective health education programs to improve women's screening practices (Parsa et al., 2011). It is indicated that health promotion research very often focuses on changing an individual's behavior by changing their beliefs and knowledge. Additionally, incremental behavior changes that focus on certain beliefs at each stage often use theoretical based studies such as stages of behavior change theory (Lee-Lin et al., 2016). Since there are only a few theoretically based studies conducted in predicting BSE and mammography screening practices on Malaysian women, there is a need to explore the literature and interrelated theories to aid in formulating a theoretical framework in demonstrating how various concepts and factors are linked that impacts the intention of women to participate in breast cancer screening.

METHODS

An extensive literature review was conducted to gather information related to existing behavior change theory and models associated with breast cancer screening. Google Scholar, Science Direct and PubMed Central® were search engines used for this purpose. The search terms used were "health behavior theory", "behavior change model" and "breast cancer screening". Additional searches were performed using keywords "theory" or "model" with health behavior or adherence with breast cancer screening. All search results were searched again using names of theories or models as keywords. The search was continued

until it reached saturation (no new theories or models of behavior change emerged). Book chapters in English that explain specific theories about health behavior were also included.

A total of six theories and models were identified from these searches. The relevant theories and models found were then reviewed for appropriateness in understanding women’s behavior to participate in breast cancer screening practices. The constructs in the theory or model were subsequently determined for their synonymy and points of overlap. Synonymous and overlapping constructs of theories or models that share a common dependent variable were then combined. The relationship between constructs in the theories or models were then evaluated to integrate the theories (Hovorka & Larsen, 2017).

RESULTS

A theoretical framework is an amalgamated interrelated concept in which a researcher chooses to assist his or her research by guiding and giving an explanation of an event or a research problem (Imenda, 2014). Public health programs and health promotion interventions were developed with a clear theoretical foundation by combining multiple theories and concepts as they are perceived to be far more effective compared to those without a theoretical base (Glanz & Bishop, 2010). Relevant theories of behavior change that guided this study are the health belief model (HBM), the theory of planned behavior (TPB), the trans-theoretical model (TTM), the theory of care seeking behavior (TCSB), the protection motivation theory (PMT) and the social cognitive theory (SCT). The researcher chose to integrate these theories as they are all related to individual health behavior and relevant to this study in aiding health promotion and education intervention. The constructs from these theories are expected to have an impact on health behavior as it can help to ascertain why an individual chooses to participate in breast cancer screening practices. These theories can potentially improve the understanding of the stage of behavioral change amongst women in BSE and mammography screening behavioral adoption. The key propositions of the fore-mentioned theories and their relationship and concepts are presented diagrammatically in Figure 1. The subsequent discussions will provide a descriptive account of the study’s theoretical framework.

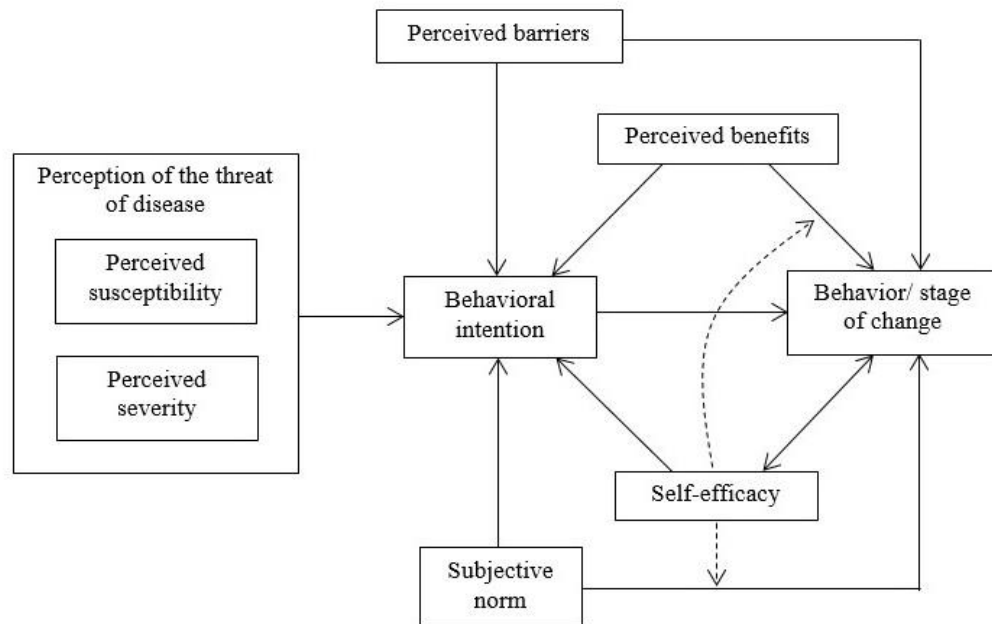


Figure 1 Theoretical framework of health beliefs on the stage of behavioral adoption of BSE and mammography.

DISCUSSION

The Health Belief Model (HBM) is used as the primary theory for the theoretical framework. Being one of the oldest health behavioral theories, the HBM is selected as it can explain and predict women's behavior in adopting breast cancer screening practices. It also one of the most frequently used theoretical models in health behavior change studies (Glanz et al., 2008; Ahmadian & Samah, 2013; Renu et al., 2015; Marzo et al., 2018). The HBM assumes that health behavior is influenced by the individuals' perceptions, expectancies and value beliefs. Individuals are likely to adopt a health behavior if the individuals consider themselves predisposed to circumstances that have possibly severe impediments. Additionally, the individuals must perceive that the proposed behavior benefited in the threat reduction of getting the disease. The individuals must also perceive that the probable advantages derived from the action taken outweighed the obstacles and the act could be carried out successfully (Glanz et al., 2008).

The major constructs of the HBM in the theoretical framework are susceptibility, severity, benefits, barriers, and self-efficacy (Glanz et al., 2008) whilst behavioral intention mediates between the perception of the threat and behavioral change to adopt BSE and mammography screening. Perceived benefits and perceived barriers are assumed to have an impact on the behavioral intention which would influence the decision in adopting the screening behaviors. This is in congruent with studies carried out on women in Korea, Turkey and Iran which indicated there was a positive association between perceived benefit of early detection and screening behavior (Secginli & Nahcivan, 2006; Hatefnia et al., 2010; Ahmadian & Samah, 2012; 2013). Nevertheless, studies conducted in Turkey found that BSE practice was associated with low perceived barriers (Secginli & Nahcivan, 2006; Khiyali et al., 2017) and women who claimed to have undergone mammography perceived higher benefits and fewer barriers compared to those who have never had mammography (Secginli & Nahcivan, 2006; Hatefnia et al., 2010; Allahverdiipour et al., 2011).

The combination of health beliefs constructs as depicted in the framework are believed to enable behavioral stage of adoption of breast screening practices (Glanz et al., 2008; Fayanju et al., 2014) whilst adequate self-efficacy would challenge the psychosocial obstacles to adopt the behavior (Ahmadian & Samah, 2012; 2013). It is because self-efficacy serves as a primary mechanism which governs an individual's ability in adopting specific behaviors (Ahmadian & Samah, 2013). This is indicated in previous studies conducted among women in Malaysia and Iran which indicated that self-efficacy has a positive correlation with practices of BSE and intention to practice BSE (Ahmadian et al., 2016; Khiyali et al., 2017). This fact is further supported by studies conducted in Iran that suggest the association of women's adherence to mammography and self-efficacy of mammography practice (Ahmadian & Samah, 2012; 2013). This is also in line with the concept of HBM, that if an individual has high self-efficacy but low perceived barriers, it is more likely for that individual to adopt the behavior (Champion & Scott, 1997; Ahmadian et al., 2016).

The theory of planned behavior (TPB) also known as the theory of reasoned action (TRA) predicts purposeful behaviors while assuming the intention to perform the behavior determines an individual's adoption of the health behavior (Ajzen, 2011; Ahmadian & Samah, 2013; Lawal et al., 2017). TPB asserts that the most important contributing factor of behavior is behavioral intention, which in turn is controlled by the attitude towards the behavior and the subjective norm associated with that behavior (Glanz et al., 2008). As can be seen from the theoretical framework (Figure 1), the subjective norm is directly related to the behavioral intention to adopt breast screening practices. In accordance with previous studies, the subjective norm was found to be a significant factor of behavioral intention (Ahmadian & Samah, 2013; Marzo et al., 2018). As such, it is pertinent to publicize positive norms pertaining to BSE and mammography in the media so that women are more likely to adopt screening practices if they believe it is beneficial to do so (Lawal et al., 2017).

According to the stages of change model, behavioral change is considered a cyclical process in which changing an individual's health behavior requires interventions consistent to the individual's

current behavioral stage (Miri et al., 2017). The Trans-theoretical Model (TTM) with the stages of behavioral change as its' fundamental construct coexisted with three other constructs; process of change, decisional balance and self-efficacy. This model postulates that behavioral changes occur through five stages namely pre-contemplation, contemplation, preparation, action, and maintenance (Glanz & Bishop, 2010; Miri et al., 2017; Naz et al., 2018). The TTM has been chosen to be used in the theoretical framework of this study because it is pertinent to investigate the efficacy of initiating an intervention rather than unequivocally exploring women's mammography screening practices behavior (Lawal et al., 2017) as women may not have the same degree of readiness in adopting breast screening practices. Further, TTM is useful in predicting and determining early detection practices among Malaysian women. Recently, a study conducted in Malaysia reported that all stages of behavioral adoption of mammography amongst women in Kuantan, Pahang have a significant relationship with health beliefs. The findings also indicated that women in the action stage are likely to proceed to the maintenance stage when they believe that undergoing mammography helps in the detection of breast cancer (Ramli et al., 2019).

The theory of care seeking behavior (TCSB) was utilized to explain why people participate in health promotional programs such as mammography screening (Lawal et al., 2017) by including external conditions that could interfere with screening behavior (Lor et al., 2013; Lawal et al., 2017; Naz et al., 2018). Self-efficacy is indicated as a construct under an external condition in this theory (Lawal et al., 2017). It can be seen in the theoretical framework that self-efficacy impacts the relationship between perceived benefit and behavioral adoption of breast screening practices as well as the relationship between subjective norm and breast screening practices. This is consistent with the findings of a study conducted in the United States which revealed that the participants' beliefs, affect, cultural norms and self-efficacy corresponded well with breast cancer screening behavior. This further supports the scope and validity of the theory in explaining the constructs that influence women's screening behavior (Lor et al., 2013). Further, TCSB is more effective in explaining the influence of socioeconomic status on the participation of breast screening behavior (Lawal et al., 2017) such as in understanding why breast screening participation rates are lower in some areas.

The Protection Motivation Theory (PMT) suggests that the purpose to carry out a prescribed health behavior is decided by an individual's apparent susceptibility and seriousness, response efficacy and self-efficacy. The fore-mentioned constructs are collectively known as threat or coping appraisal. While threat appraisal evaluates the maladaptive response such as not performing BSE, coping appraisal appraises the possibility of making the adaptive response, like performing BSE (Rogers, 1983; Fry & Prentice-Dunn, 2006; Wood, 2008). As depicted in the theoretical framework, each construct in the theoretical framework will influence an individual's motivation or intention to adopt breast screening practices. This is further supported by a previous study carried out in Singapore which demonstrated that threat and coping appraisal are substantial and positively correlated with motivation for embracing early breast cancer screening such as BSE and mammography (Lwin, 2014).

The Social Cognitive Theory (SCT) by Bandura and Adams (1977) on the other hand, emphasizes an individual's perceived abilities to act competently and effectively in carrying out a specific behavior to promote a desirable outcome (Wood, 2008). The SCT focusses on reciprocal interaction between people and their surroundings (Glanz et al., 2008; Glanz & Bishop, 2010). In this scenario, a person can represent either a responder to change or an agent for change (Glanz & Bishop, 2010). According to Bandura, self-efficacy, a pertinent construct in the theory is related positively to motivation and is significantly controlled by behavioral planning and intention (Bandura & Adam, 1977; Wood, 2008). Bandura and Adam further affirmed that high self-efficacy tends to initiate behavior and effort in overcoming barriers like fear (Bandura & Adam, 1977; Ahmadian & Samah, 2012; 2013; Marzo et al., 2018). As depicted in the theoretical framework, the impact of both self-efficacy and behavioral adoption is reciprocal. This is evidenced by previous studies that discovered positive relationships between BSE and self-efficacy (Ahmadian et al., 2016; Khiyali et al., 2017; Marzo et al., 2018) and also self-efficacy as a significant factor in initiating mammography screening (Ahmadian & Samah, 2012; 2013; Marzo et al., 2018). Many constructs or

components of the theories outlined above are similar or synonymous that provide a point of overlap between constructs. Table 1 portrays the similarities between constructs and the integration of theories for this theoretical framework.

Table 1 Similarities between constructs in the theoretical framework.

Theory	HBM	TPB	TTM	TCSB	PMT	SCT
Constructs	Perceived susceptibility				Vulnerability	
	Perceived severity				Severity	
	Perceived barrier				Response cost	
	Perceived threat/benefit	Attitude	Decisional balance	Affect and belief (utility)	Response efficacy	
	Self-efficacy	Perceived behavioral control	Self-efficacy	External factor (facilitating conditions)	Self-efficacy	Self-efficacy
		Subjective norm		Norm		
		Intention			Protection motivation	

(HBM: Health Belief Model, TPB: Theory of Planned Behavior, TTM: Trans Theoretical Model, TCSB: Theory of Care Seeking Behavior, PMT: Protection Motivation Theory, SCT: Social Cognitive Theory)

CONCLUSION

The HBM emphasizes that behavior change relies on individual beliefs, behavioral patterns and habits (Talbert, 2008). By combining and integrating HBM with other relevant theories, factors regarding women’s behavioral adoption of BSE and mammography can be explored and better understood. Even though, various theories may use different constructs but the conceptualization of the constructs across theories is possible by studying its operating definitions. The integration of appropriate theories into a theoretical framework aid in understanding the relationships between constructs in understanding health-related behaviors (Glanz et al., 2008) and its’ outcome in encouraging women to practice breast cancer screening practices for early breast cancer detection.

LIMITATIONS

There are limitations to this study. This study is based on several theories of behavior change that may not be specifically related to breast cancer screening because the theories tend to cover a range of different health behaviors. Some theories do not address the influence of habitual and socioeconomic factors on behavior and also do not take into account the variables that are factors of behavioral intent. In addition, a direct comparison between these theories is based on little evidence that may have manipulated the findings of this study.

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REFERENCES

- Ahmadian, M., & Samah, A. A. (2012). A literature review of factors influencing breast cancer screening in Asian countries. *Life Science Journal*, 9(2), 585–594.
- Ahmadian, M., & Samah, A. A. (2013). Application of health behavior theories to breast cancer screening among Asian women. *Asian Pacific Journal of Cancer Prevention*, 14(7), 4005–4013.
- Ahmadian, M., Carmack, S., Samah, A. A., Kreps, G., & Saidu, M. B. (2016). Psychosocial predictors of breast self-examination among female students in Malaysia: A study to assess the roles of body image, self-efficacy and perceived barriers. *Asian Pacific Journal of Cancer Prevention*, 17(3), 1277–1284.
- Ajzen, I. (2011). The theory of planned behaviour: Reactions and reflections. *Psychology and Health*, 26(9), 1113–1127.
- Akhtari-Zavare, M., Juni, M. H., Ismail, I. Z., Said, M. S., & Latiff, L. A. (2015). Health beliefs and breast self-examination among undergraduate female students in public universities in Klang Valley, Malaysia. *Asian Pacific Journal of Cancer Prevention*, 16(9), 4019–4023.
- Allahverdipour, H., Asghari-Jafarabadi, M., & Emami, A. (2011). Breast cancer risk perception, benefits of and barriers to mammography adherence among a group of Iranian women. *Women & Health*, 51(3), 204–219.
- Bandura, A., & Adams, N. E. (1977). Analysis of self-efficacy theory of behavioral change. *Cognitive Therapy and Research*, 1(4), 287–310.
- Burhans, M. S. (2018, November 19). Misalignment of breast cancer beliefs and scientific evidence. Retrieved June 13, 2019 from https://www.fredhutch.org/en/news/spotlight/2018/11/phs_schell_jgloboncol.html
- Champion, V.L., & Scott, C. R. (1997). Reliability and validity of breast cancer screening belief scales in African American women. *Nursing Research*, 46(6), 331–337.
- Dahlui, M., Ramli, S., Bulgiba, A. M. (2011). Breast cancer prevention and control programs in Malaysia. *Asian Pacific Journal of Cancer Prevention*, 12, 1–4.
- Donnelly, T. T., Al Khater, A., Al-Bader, S. B., Al Kuwari, M. G., Al-Meer, N., Malik, M., et al. (2013). Beliefs and attitudes about breast cancer and screening practices among Arab women living in Qatar: A cross-sectional study. *BMC Women's Health*, 13, 49.
- Erbil, N., & Bolukbas, N. (2014). Health beliefs and breast self-examination among female university nursing students in Turkey. *Asian Pacific Journal of Cancer Prevention*, 15(16), 6525–6529.
- Fayanju, O. M., Kraenzle, S., Drake, B. F., Oka, M., & Goodman, M. S. (2014). Perceived barriers to mammography among underserved women in a Breast Health Center Outreach Program. *American Journal of Surgery*, 208(3), 425–434.

- Fry, R. B., & Prentice-Dunn, S. (2006). Effects of a psychosocial intervention on breast self-examination attitudes and behaviors. *Health Education Research, 21*(2), 287–295.
- Glanz, K., Rimer, B. K., & Viswanath, K. (2008). *Health behavior and health education: Theory, research, and practice* (4th ed.). San Francisco: Jossey-Bass.
- Glanz, K., & Bishop, D. B. (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual Review of Public Health, 31*, 399–418.
- Hatefnia, E., Niknami, S., Bazargan, M., Mahmoodi, M., Lamyianm, M., & Alavi, N. (2010). Correlates of mammography utilization among working Muslim Iranian women. *Health Care for Women International, 31*, 499–514.
- Hovorka, D. S., & Larsen, K. (2017). Modes of theory integration. In Proceedings of the 50th Hawaii International Conference on System Sciences (HICSS), 5709–5716.
- Imenda, S. (2014). Is there a conceptual difference between theoretical and conceptual frameworks? *Journal of Social Sciences, 38*(2), 185–195.
- Kanaga, K. C., Nithiya, J., & Noor Shatirah, M. F. V. (2011). Awareness of breast cancer and screening procedures among Malaysian women. *Asian Pacific Journal of Cancer Prevention, 12*, 1965–1967.
- Khiyali, Z., Aliyan, F., Kashfi, S. H., Mansourian, M., & Jeihooni, A. K. (2017). Educational intervention on breast self-examination behavior in women referred to health centers: Application of health belief model. *Asian Pacific Journal of Cancer Prevention, 18*(10), 2833–2838.
- Kong, Y. C., Bhoo-Pathy, N., Subramaniam, S., Bhoo-Pathy, N., Taib, N. A., Jamaris, S., et al. (2017). Advanced stage at presentation remains a major factor contributing to breast cancer survival disparity between public and private hospitals in a middle-income country. *International Journal of Environmental Research and Public Health, 14*, 427.
- Kwok, C., Endrawes, G., & Lee, C. F. (2015). Breast cancer screening beliefs questionnaire: Psychometric properties assessment of the Arabic version. *European Journal of Oncology Nursing, 20*, 42–48.
- Lawal, O., Murphy, F., Hogg, P., & Nightingale, J. (2017). Health behavioural theories and their application to women's participation in mammography screening. *Journal of Medical Imaging and Radiation Sciences, 48*, 122–127.
- Lee-Lin, F., Nguyen, T., Pedhiwala, N., Dieckmann, N. F., & Menon, U. (2016). A longitudinal examination of stages of change model applied to mammography screening. *Western Journal of Nursing Research, 38*(4), 441–458.
- Loh, S. Y., Sunthari, S., & Tin, T. S. (2017). Cancer awareness in Malaysia – What's next? *Journal of Cancer & Oncology, 1*(1), 000105.
- Lor, M., Khang, P. Y., Xiong, P., Moua, K. F., & Lauer, D. (2013). Understanding Hmong women's beliefs, feelings, norms, and external conditions about breast and cervical cancer screening. *Public Health Nursing, 30*(5), 420–428.
- Lwin, M. O. (2014). Examining Asian women's motivations to undergo breast cancer screening. *Journal of Women's Health Care, 3*(3), 158.

- Marzo, R. R., Sukkirasingam, D., Letchumanan, V., Anbarasu, S., Ramiah, T. R., Vellasamy, S. D., et al (2018). Breast cancer screening practice: Early detection saves lives. *Emergency Medicine*, 8(3), 383.
- Miri, M., Moodi, M., Miri, M., Sharifzadeh, G., & Eshaghi, S. (2017). Breast self-examination stages of change and related factors among Iranian housewives women. *Journal of Health Sciences and Technology*, 1(1), 41-48.
- Naz, M. S. G., Simbar, M., Fakari, F. R., & Ghasemi, V. (2018). Effects of model-based interventions on breast cancer screening behavior of women: A systematic review. *Asian Pacific Journal of Cancer Prevention*, 19(8), 2031-2041.
- Nordin, N., Yaacob, N. M., Abdullah, N. H., & Hairon, S. M. (2018). Survival time and prognostic factors for breast cancer among women in North-East Peninsular Malaysia. *Asian Pacific Journal of Cancer Prevention*, 19(2), 497-502.
- Parsa, P., Kandiah, M., & Parsa, N. (2011). Factors associated with breast self-examination among Malaysian women teachers. *East Mediterranean Health Journal*, 17(6), 509-516.
- Ramli, H. A., Moey, S. F., & Mutalib, A. M. A. (2019). The relationship of health beliefs on the stage of mammography behavior adoption amongst women in Kuantan, Pahang. *Asian Pacific Journal of Cancer Prevention*, 20(6), 1913-1920.
- Renu, G., George, A., Pai, M. S., Nayak, B. S., Mundkur, S. C., Nayak, D. M., et al (2015). Health belief model: A theoretical framework for the development of home safety supervisory program in childhood injury prevention. *International Journal of Current Research*, 7(11), 22691-22695.
- Rogers, R. (1983). Cognitive and physiological processes in fear-based attitude change: A revised theory of protection motivation. In J.T. Cacioppo & R.E. Petty (Eds.), *Social psychophysiology: A sourcebook* (pp. 153-176). New York: Guilford Press.
- Rosmawati, N. H. N. (2010). Knowledge, attitude and practice of breast self-examination among women in a suburban area in Terengganu, Malaysia. *Asian Pacific Journal of Cancer Prevention*, 11, 1503-1508.
- Secginli, S., & Nahcivan, N. O. (2006). Factors associated with breast cancer screening behaviors in a sample of Turkish women: A questionnaire survey. *International Journal of Nursing Studies*, 43, 161-171.
- Shang, C., Beaver, K., & Campbell, M. (2015). Social cultural influences on breast cancer views and breast health practices among Chinese women in the United Kingdom. *Cancer Nursing*, 38(5), 343-350.
- Talbert, P. Y. (2008). The relationship of fear and fatalism with breast cancer screening among a selected target population of African American middle class women. *Journal of Social, Behavioral and Health Sciences*, 2(1), 96-110.
- Wood, M. E. (2008). Theoretical framework to study exercise motivation for breast cancer risk reduction. *Oncology Nursing Forum*, 35(1), 89-95.
- Yip, C. H., Taib, N. A. M., & Mohamed, I. (2006). Epidemiology of breast cancer in Malaysia. *Asian Pacific Journal of Cancer Prevention*, 7, 369-374.
- Yip, C. H., Bhoo Pathy, N., & Teo S. H. (2014). A review of breast cancer research in Malaysia. *Medical*

Journal of Malaysia, 69, 7-22.