

Original Article **Improvement of Awareness and Knowledge in Breast Cancer Using Online Learning****Nurulhuda MH¹, Norwati D, Sit Norazlina J, MAR Husbani**¹Faculty of Medicine, Universiti Sultan Zainal Abidin, Kuala Terengganu, Malaysia**nurulhudamh@unisza.edu.my***Abstract**

Background: Breast cancer is the most common cancer and the leading cause of cancer death among women in Malaysia, accounting to 32.1% of all cancer among women. Preventive activities of breast health especially mammogram screening was found to be effective in reducing the mortality and morbidities related to breast cancer. . However, the number of people who come for screening is still unsatisfactory. Many patients come in advanced stage of breast cancer attributed by lack of awareness and knowledge of the disease. The aim of this study was to introduce a multimodality online course on breast cancer and its screening; and to measure its effectiveness in providing the awareness and knowledge in breast cancer. Methodology: An online course was designed incorporating essential knowledge regarding breast cancer and its screening. Group sampling was done to sample 30 undergraduate students. Knowledge and awareness on breast cancer and its screening was measured using a validated questionnaire pre and post exposure to the online course. Results: There was significant difference in Pre- & Post-exposure test knowledge ($p < 0.001$; CI 3.4, 9.2, $t = 4.74$). Conclusion: Multimodality online learning is a useful tool to increase awareness and knowledge regarding breast cancer.

Keywords: Breast cancer, online learning, online course, multimodality, Malaysia

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Introduction

Breast cancer is the most common cancer and the leading cause of cancer death among women in Malaysia, accounting to 32.1% of all cancer among women [1]. Preventive activities of breast health especially mammogram screening was found to be effective in reducing the mortality and morbidities related to breast cancer [2]. Mammogram screening for example, may reduce death from breast cancer up to 35% [3]. However, practices of the preventive activities in Malaysia is still found to be only between 41 to 46% [4].

Current data of breast cancer shows much effort is needed to increase knowledge and awareness of breast cancer and its screening. Despite the availability of screening program, the percentage of patient presented at the advance stage are still evident. About 30 to 50 percent of breast cancer patient presented at stage III and IV which give rise to a grave prognosis and low survival rate [5]. A 5 years survival rate for stage III is between 40 to 70 % whereas stage IV average survival rate is 3 years [5]. As compared to other countries, Malaysia has higher Mortality to Incidence ratio (0.49), Thailand (0.38), South Korea (0.12) and Hong Kong (0.16) [6]. It showed that most of the cancer are detected late or ineffective treatment and lead to high mortality rate. Most of the studies consistently showed that high mortality is associated with poor cancer awareness, lack of early detection, poor of implemented and effective screening program and lack of timely access to cancer treatment [4, 7].

Preventive activities of breast health especially mammogram screening was found to be effective in reducing the mortality and morbidities related to breast cancer. However, based on National Health and Morbidity Survey, only 6.6 percent of eligible women in Malaysia had undergone mammogram [8]. The common factors of mammogram poor uptakes include the perception of not being at risk, lack of time, distance to screening facilities, not knowing of where to go, cost of screening, fear of cancer and fear of painful mammography [9].

Therefore, we have designed a web-based education regarding breast cancer and its screening method to increase the awareness of breast cancer. It also includes the vital information about mammogram, prevention of breast cancer and multimodal teaching of breast self-examination which will increase the knowledge, awareness and increases the chance of early detection of breast cancer as well as the accessible center for mammogram. Our web is also offering extra information on the individual risk of user for having breast carcinoma based on risk factors. The existing web or app-based breast cancer education are very general and does not provide the information This information is very important so that the user know about their risk of having

breast cancer and will urge the user to act appropriately and will prevent further delay. Thus, the capture of the disease will be at the early stage which will influence the prognosis and outcome of the patient.

Materials and Methods

A multimodality education tool in the form of an online web-based breast cancer education tool was designed. A survey was done beforehand to identify the gaps in the current online education materials. It was found that there is lack of effective Malay medium education materials online and also lack of suggestion of screening based on the person's risk category for developing breast cancer. The content was then designed to educate the public to increase awareness on symptoms of breast cancer and its screening and increases the chance of early detection. It includes objective learning outcome, practical content and video on breast self-examination (Figure 1). It was also used for teaching of medical students in holistic approach regarding breast cancer, which not only include the information about breast cancer and screening, but also the prevention by modifying lifestyle risk factors (Figure 2).

This web-based education effectiveness was then tested to a group of undergraduate students. Two out of four subgroups of year four students were purposively sampled. Each subgroup consist of 15 to 16 students. Inclusion criteria for the students is that they were at the first two weeks of family medicine posting with minimal prior exposure to breast cancer screening in primary care.

A questionnaire on awareness of breast cancer and its screening was designed and validated. The questionnaire consist of three parts: i) Awareness of breast cancer- 11 items. ii) Knowledge of screening of breast cancer- 5 items iii) Knowledge of risk factors and prevention of breast cancer-18 items. The entire questionnaire took approximately 10 minutes to be completed. The pilot study with this questionnaire done on 30 respondents revealed a Cronbach's alpha of 0.80. For the Cronbach's alpha, between 0.7 and 0.9 indicate that it has good reliability.

A pre- and post- test on knowledge and awareness of breast cancer in a group of students exposed to the web-based education material were compared. Sample size was calculated via Power Sample size calculator using power analysis for one sample, 1-sided mean: power of 0.80 and alpha of 5%, revealing a minimum sample size of 7. A group of 30 undergraduate students who had only minimal exposure towards knowledge in breast cancer were given the questionnaire prior to exposure to the online education material. Then they were shown the online education material and instructed to answer the post-test after they

completed the online education course without referring to the material. Data were analyzed using SPSS version 21 and paired t-test was applied.

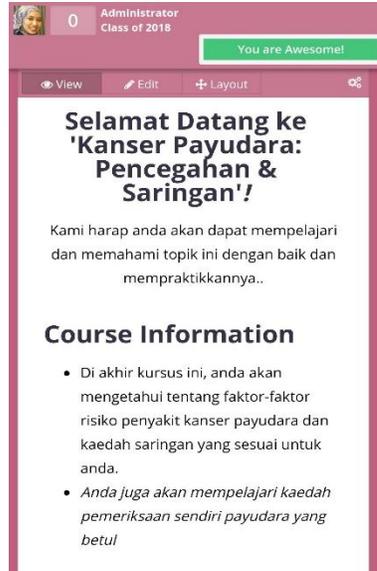


Figure 1. Objective learning outcome.

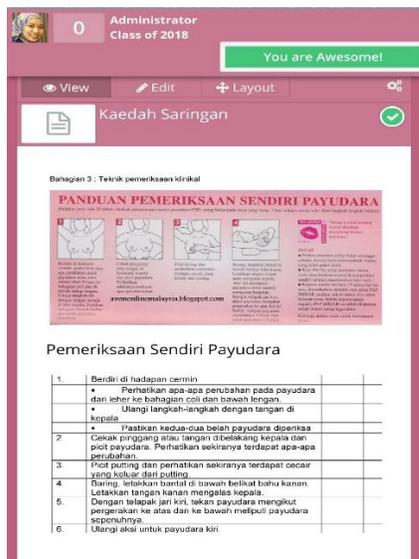


Figure 2. Example of practical content in the web.

Results

Response rate was 93% where 28 out of 30 respondents completed the pre- and post-exposure test questionnaires.

The mean total awareness and knowledge regarding breast cancer increased from 118 to 127. Difference of pre-exposure and post-exposure score for each respondents for the components is shown in Table 1. The component which show the most increase in score was knowledge in screening of breast cancer.

Table 1. Mean difference of pre-exposure and post-exposure score for different test components

Component	Mean difference	Std Deviation
Awareness of breast cancer	1.86	3.40
Knowledge of screening of breast cancer	4.07	2.43
Knowledge of risk factors and prevention	4.04	6.47

The online education designed proved to be effective to increase the knowledge of breast cancer and its' screening ($p < 0.001$, CI 6.78, 11.79, $t = 7.6$), as shown in Table 2.

Table 2. Comparison of Post-exposure and pre-exposure questionnaire score

Post-exposure – pre-exposure scores	Mean	SD	Std. Error Mean	95% Confidence Interval of the difference	t	df	Sig. (2-tailed)
	9.29	6.45	1.22	6.78-11.79	7.6	27	0.000

Discussion

With a breast cancer mortality at 47% higher than the world figure, much effort is needed to increase the awareness and knowledge regarding breast cancer in Malaysia [5]. This is evident from the report by the Economist Intelligence Unit regarding breast cancer in Asia, where they listed poor understanding of the disease as one of the main factors which impedes the efforts to address this problem. Numerous efforts at awareness raising have had little impact and even free screening programmes have had such small uptake [5, 8]. Therefore it is high time that new strategies such as online and app-based education are introduced and popularized to increase awareness and knowledge. This is based on the fact that online searching for information is common practice by university students and working women, with Internet sites set up to provide correct health information in Europe and America meant to improve the health of women [10].

Previous studies indicate that online education help develop a positive health attitude towards protection against breast cancer and on increasing women's motivation to practice breast self-examination [11, 12]. However, local factors need to be considered in designing such education materials, especially taking into account the local barriers of screening of breast cancer. In Malaysia, the important common factors of poor uptake in screening of breast cancer include the perception of not being at risk, not knowing of where to go, cost of screening and fear of painful mammography[9].

Therefore we have inculcated all these information and tackled the misconception involved in the designed online education.

The significant increase in knowledge as a result of this study is similar to other studies which show increase in knowledge with online education [12,13]. In a study in Turkey, significant difference of knowledge levels of breast self-examination after online education even persisted after one month and six months [13].

It is worth noting that the most significant increase in knowledge was on the screening methods of breast cancer (Table 1), indicating that knowledge regarding screening is most important to be emphasized and disseminated. This is due to the fact that previous studies have shown that the main reasons patients did an indicated screening test was only be recommendation of their doctor[14], and knowledge regarding need of screening for cancer is still low.

The limitation of the study is that immediate recall was tested instead of retesting after a period of time. The persistence of increased knowledge after a period of time may be useful towards change attitude and practice instead of immediate recall. We also did not use a comparison group with the standard teaching method, which may be considered in future study.

As a conclusion, this study has re-emphasized that using the internet, though online education and open courses, can be effective in giving information in the area of health and causing changes in knowledge and awareness in the targeted audience. These tools need to be designed in accordance to the needs of the population in order to optimize and improve health seeking behavior and screening of diseases such as breast cancer.

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