

Artikel Asli/Original Articles

The Effectiveness of Educational Intervention Program on Knowledge of BSE among Secondary School Girls in Seremban, Negeri Sembilan (Keberkesanan Program Intervensi Pendidikan mengenai Pengetahuan BSE dalam Kalangan Pelajar Perempuan Sekolah Menengah di Seremban, Negeri Sembilan)

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ABSTRACT

Breast Self-Examination (BSE) is important to be introduced to secondary school girls in order to develop a positive health behavior. Limited attention has been given on knowledge among school girls. Hence, this study was conducted to determine the effectiveness of educational intervention program on knowledge of BSE among secondary school girls in Seremban, Negeri Sembilan. A cross-sectional study was conducted among 502 volunteered secondary school girls using pre and post self-administered validated questionnaire. The mean (SD) age of the participants was 14.9 (\pm 0.1) years. Majority of the participants were Malays (87.1%). Pre-intervention educational program revealed that 91% of the participants had poor knowledge whereas 9% had good knowledge on BSE. Post-educational intervention program showed that knowledge has increased by 33.4% and percentage for 'poor' knowledge reduced by 33.4% from pre-intervention scored ($p < 0.001$). There was no significant difference on knowledge of BSE among participants with and without family history of breast cancer ($p = 0.204$). Health campaign was the top source of information to gain knowledge related to BSE prior (56.6%) and after (90.2%) the intervention program ($p < 0.001$). Thus, the educational intervention program was found to be effective method to improve the knowledge on BSE among secondary school girls.

Keywords: Educational intervention program; breast self-examination; knowledge; school girls

ABSTRAK

Pemeriksaan Sendiri Payudara (PSP) penting untuk diperkenalkan kepada pelajar perempuan sekolah menengah supaya menjadi tabiat positif terhadap kesihatan. Terdapat tumpuan yang terhad mengenai pengetahuan ini dalam kalangan pelajar sekolah. Justeru, kajian ini dijalankan untuk menentukan keberkesanan program intervensi pendidikan terhadap pengetahuan PSP dalam kalangan pelajar perempuan sekolah menengah di Seremban, Negeri Sembilan. Satu kajian keratan rentas dijalankan terhadap 502 pelajar perempuan sekolah menengah secara sukarela menggunakan borang soal selidik yang telah disahkan. Purata (SP) umur peserta adalah 14.9 (\pm 0.1) tahun. Majoriti peserta adalah Melayu (87.1%). Program pra-intervensi pendidikan mendedahkan bahawa 91% peserta mempunyai tahap pengetahuan berkaitan PSP yang lemah manakala 9% mempunyai tahap pengetahuan yang baik. Program pasca-intervensi pendidikan menunjukkan bahawa tahap pengetahuan telah meningkat sebanyak 33.4% dan peratusan untuk tahap pengetahuan 'lemah' berkurang sebanyak 33.4% berbanding markah pra-intervensi ($p < 0.001$). Terdapat perbezaan yang signifikan pada tahap pengetahuan PSP antara peserta yang mempunyai dan tidak mempunyai sejarah keluarga yang menghidap kanser payudara ($p = 0.204$). Kempen kesihatan merupakan sumber maklumat utama bagi mendapatkan pengetahuan mengenai PSP sebelum (56.6%) dan selepas (90.2%) program intervensi ($p < 0.001$). Maka, program intervensi pendidikan didapati berkesan sebagai cara untuk meningkatkan pengetahuan terhadap PSP dalam kalangan pelajar perempuan sekolah menengah.

Kata kunci: Program intervensi pendidikan; pemeriksaan sendiri payudara; pengetahuan; pelajar perempuan sekolah

INTRODUCTION

Breast cancer is the most common cancer among women in Malaysia (Hisham & Yip 2004). It was reported that in 2007 until 2011, about 18,206 breast cancer incidences were reported among Malaysian women with 40.7% cases reported among women in age group of 25 to 59 years old

(Ab Manan et al. 2015). Most breast cancers occur in older women (McPherson et al. 2000). However age-adjusted incidence rate for breast cancer among all adolescents and young adults (AYAs: ages 15-39) was 18.9 per 100,000 women where it increased rapidly between 15 and 39 years of age (Keegan et al. 2012).

Mammography is the best screening tool for breast cancer and it can detect cancers at early stage, when they are small and the chances of survival are highest (Komen et al. 2012). American Cancer Society (2018) recommended that women ages 40 to 44 years old should start annual breast cancer screening with mammograms, women age 45 to 54 years old should undergo mammogram screening yearly and women 55 years old and above should undergo it every two years, or can continue yearly screening. Thus, Breast Self-Examination (BSE) may be considered to be an alternative to mammography (Hackshaw & Paul 2003). In addition, many researchers and health practitioners emphasised that BSE provide an alternative and relatively simple, inexpensive means of early detection of breast cancer that can be performed in conjunction with mammography or clinical breast examinations (Norman & Brain 2005).

BSE is recommended for young women, as the sensitivity of mammogram is low in younger women (Rosenberg et al. 1998) due to greater density of breast tissue which inaccurately diagnosed by mammography (Gabriel & Domchek 2010). Moreover, BSE is a procedure which helps a woman to know her breast and allows her to detect any changes in the breast; such as breast masses or lumps (Burke et al. 2007). This technique is able to increase the awareness of breast cancer among the women to make them able to identify breast cancer at earliest stage (Norman & Brain 2005). According to Clinical Practice Guidelines (2010), the practice of BSE has been seen to empower women and encourage them to take responsibility for their own health.

However, a study reported that less than 1% of the participants had very good knowledge and more than 30% of the study population had poor to very poor knowledge (Hadi et al. 2010). This is similar to the other studies where most of young females had a low level of knowledge in relation to breast cancer prevention (Akhtari-Zavare et al. 2015; Che Mut et al. 2018), where the secondary school girls had very low knowledge on breast cancer and BSE practice (Al-Haji & Moawad 2015; Che Mut et al. 2019). In addition, the most important information on breast cancer which is the knowledge on signs and symptoms of breast cancer are also poor among young women. This is proved by Ranasinghe et al. (2013), where majority of respondents were not aware of early warning signs such as nipple changes and a lump under the armpit. This observation reflects the seriousness of possible repercussion if signs and symptoms of breast cancer were to be downplayed among the young women, as it will show the earliest changes to neoplastic disease of the breasts. This is supposedly cannot be happened among these young women because the sign and symptoms of breast cancer are important as it will show the early changes on the breasts.

Thus, educational intervention program plays an important role to improve the BSE knowledge among these

young women, as well as to give an early exposure to them about the early detection technique. The aim of this study is to determine the effectiveness of educational intervention program on knowledge regarding BSE among the secondary school girls in Seremban, Negeri Sembilan.

EXPERIMENTAL METHODS

STUDY DESIGN AND POPULATION

A cross-sectional study was conducted from February 2018 to July 2018 at five randomly selected secondary schools in Seremban, Negeri Sembilan. A total of 502 female students aged 13, 14 and 16 years old voluntarily participated. Female students aged 15 and 17 years old were excluded from the sampling frame in order to obey the policy from Ministry of Education Malaysia to not included examination year students. Informed consent was obtained from each of the participants prior to the program.

DATA COLLECTION

Each of the participants was given two similar sets of validated questionnaire in Malay language that need to be answered before and after the educational talk. A pamphlet which contained the information regarding BSE and breast cancer were distributed before the educational intervention. The questionnaire was designed to obtain the information on socio-demographic data, knowledge and awareness on breast cancer, and knowledge and awareness on BSE. The pilot test was done among 30 secondary school girls. The reliability test of the knowledge and awareness of breast cancer and BSE were evaluated by Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL) version 23.0, with $\alpha = 0.85$ and $\alpha = 0.79$, respectively.

The educational talk was given by one qualified health professionals with master degree with at least 5 years clinical experience. It was conducted approximately for two hours. The session covered cancer trends in Malaysia, risk factors of breast cancer, sign and symptoms of breast cancer and breast cancer screening methods. A part of the session, there was a media player on BSE techniques and the educational pamphlets were given to the participants. Demonstration of BSE techniques were done on breast phantom made of 3B SKINlike™ high-quality silicone consisted of normal, benign and malignant tumour at different stages of development (*3B Scientific, Germany*). Through the demonstration session, participants were able to palpate and differentiate the types of lumps and recognize the structure of lumps. The participants were guided by the facilitator during the program and fully understood the questions being asked. A summary on intervention program is shown in the Table 1.

TABLE 1. Summary on educational intervention program

Unit	Content	Duration
Unit 1	Pre-questionnaire distributed to the selected students before program conducted.	20 minutes
Unit 2	Breast cancer Cancer trends in Malaysia Risk factors Breast cancer screening methods	1 hour (Talk) +
Unit 3	Breast Self-Examination (BSE) Sign and symptoms of breast cancer Video of BSE techniques	5 minutes (video)
Unit 4	Demonstration on breast phantom.	15 minutes
Unit 5	Post-questionnaire distributed to the same selected students after program conducted.	20 minutes

ETHICAL CONSIDERATION

Prior to commencing the study, ethical clearance was sought from Ethical Review Board from KPJ Healthcare University College [KPJUC/RMC/BMI/EC/2017/121], Ministry of Education Malaysia [KPM.600-3/2/2-eras(115)] and state education department [JPNS.SPS.PP.100-1/7 Jld.17(19)].

STATISTICAL ANALYSIS

The choices of answer 'Yes, No and Do not know' were provided for all the statements, with 'Yes' coded as '2'; 'Do not know' coded as '1' and 'No' coded as '0'. The quartiles were used to set the cut off value. The total score for each participant were arranged in ascending order and the median total score value was used as cut off point (Alharbi et al. 2011; Dey et al. 2015). The level of BSE knowledge was categorized into poor (with scores less than the median) and

good (with scores more than median). For knowledge and awareness of breast cancer, the median of total score was 42. A score of 0-42 was considered poor knowledge and 43-52 was considered good knowledge. On the other hand, the median of total score for knowledge and awareness of BSE was 34. A score of 0-34 was considered poor knowledge and 35-62 was considered as good knowledge. Descriptive analysis and paired t-test were used to compare the scores of pre- and post- intervention program thus determine the effectiveness of educational intervention program. All the data were analysed using the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL) version 23.0 and Microsoft Excel (Version 2013).

RESULTS

A total of 502 questionnaires were fully completed. Table 2 shows the socio-demographics data of the participants.

TABLE 2. Socio-demographic data (n = 502)

Socio-demographic	Frequency (n)	Percentage (%)
Age		
13 years old	99	19.7
14 years old	105	20.9
16 years old	298	59.4
Race		
Malay	437	87.1
Chinese	14	2.7
Indian	48	9.6
Others	3	0.6
Father's education		
Primary school	18	3.6
Sijil Pelajaran Malaysia	224	44.6
Diploma	153	30.5
Bachelor	67	13.3
Master Degree	29	5.8
PhD	11	2.2

continued

TABLE 2. *Continued*

Socio-demographic	Frequency (n)	Percentage (%)
Father's occupation		
Government sector	123	24.5
Private sector	227	45.2
Self-Employed	132	26.3
unemployed	20	4.0
Mother's education		
Primary school	34	6.8
Sijil Pelajaran Malaysia	247	49.2
Diploma	136	27.1
Bachelor	53	10.5
Master Degree	23	4.6
PhD	9	1.8
Mother's occupation		
Government sector	127	25.3
Private sector	91	18.1
Self-Employed	92	18.4
unemployed	192	38.2
Family history of breast cancer		
Yes	31	6.2
No	471	93.8

The age ranges of the participants are from 13, 14 and 16 years old with mean age of 14.9 (± 0.1). Overall, majority of the participants were Malays (87.1%), 9.6% were Indians, 2.7% were Chinese and 0.6% were the others. Only 6.2% participants had a family history of breast cancer.

The changes in knowledge level of BSE before and after educational intervention program is shown in

Table 3. The result reveals that 9% of the participants with good knowledge is hiking up to 42.4% after the intervention program. Indirectly, 91% of participants with poor knowledge of BSE was decreasing to 57.6%. The improvement of knowledge before and after the program is statistically significance ($p < 0.001$).

TABLE 3. Knowledge of BSE before and after educational intervention program

Knowledge of BSE	Pre- educational intervention program, n (%)	Post- educational intervention program, n (%)	<i>p</i> -value
Good	45 (9)	213 (42.4)	<0.0001
Poor	457 (91)	289 (57.6)	

The source of previous knowledge gained related to BSE were asked in both pre and post questionnaire to identify the most chosen medium that the participants usually used to gain information about BSE. A descriptive analysis was done to compare the source used by participants to gain knowledge on BSE between pre and post-test are shown in Figure 1. Before the program, the participants mostly chose health campaign as the medium they gained knowledge related to BSE. The effectiveness of the health campaign was strengthened when the participants chose the medium as the top source (90.2%) of information after the educational intervention program then, followed by mass media and books and journals. This proved that health campaign provided information on BSE for the participants more than other sources.

Despite health campaign chosen as top source of information by the participants, the simple regression analysis was done to correlate between the several sources of knowledge gained related to BSE with the post-test knowledge of BSE. The results showed that books and journals were strongly contributing to the post-test knowledge of BSE ($r = 0.45$), followed by mass media and parents. This showed that even though the majority of the participants chose health campaign as previous source of knowledge gained related to BSE, the participants that choose books and journals got more on knowledge of BSE than others. This might be due to the contents for the slides and pamphlets were picked from the books and previous journals which is easier to be understood by them. There

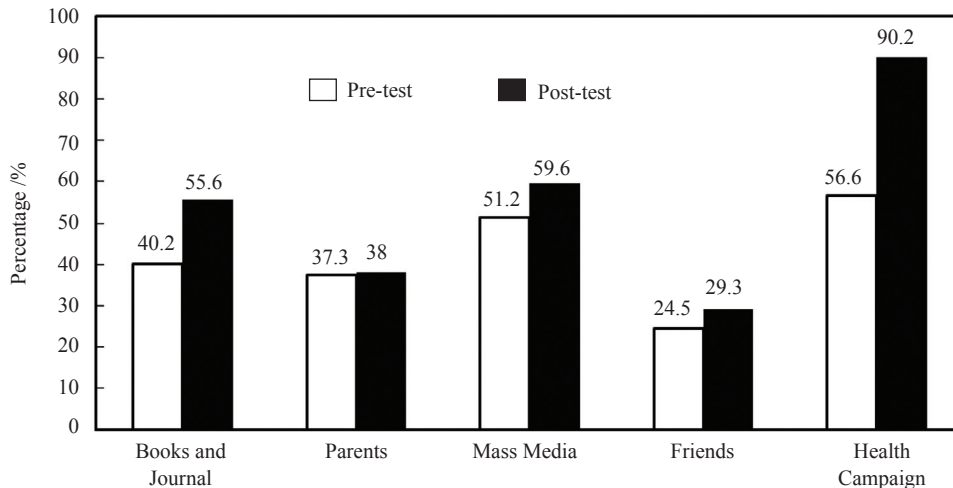


FIGURE 1. Descriptive analysis on comparison of the source used by participants to gain knowledge on BSE between pre and post-test

is significant linear relationship between the sources of knowledge gained related to BSE and post-test knowledge of BSE ($p < 0.001$).

The comparison between participants with and without family history of breast cancer with post-knowledge of BSE found that the mean score for participants with and without family history of breast cancer is 35.3 (± 7.5) and 33.7 (± 6.9), respectively. There is no significance difference on knowledge of BSE between participants with and without family history of breast cancer.

Paired t-test was used to test the significance on the score of BSE knowledge between before and after educational intervention program. The mean score of knowledge of BSE before and after the educational intervention program is 20.8 (± 10.1) and 33.8 (± 6.9), respectively. There is statistically significance of difference between knowledge of BSE before and after educational intervention program ($p < 0.001$).

DISCUSSION

Developing a positive health behaviour should be started as early as possible. Thus, school age group is the most suitable target group for promoting the knowledge on breast cancer and early detection of breast cancer. This study found that 9.0% had good knowledge on BSE before the educational intervention program. Study findings showed that the knowledge level of the participants was improved after the educational intervention program, which reflects that the effectiveness of educational intervention program was proved by the increasing of mean score of knowledge after the intervention program. The improvement for good knowledge was involving up to 42.4% participants.

The improvement of knowledge after an educational intervention program among school girls was supported by a study conducted by Sapkota et al. (2016). They reported only 1.6% of participants had adequate level of knowledge and 75.4% had inadequate level of knowledge on BSE

prior to the program. After the educational intervention program, the number of participants with adequate level of knowledge was raised up to 62.3% and those with inadequate level of knowledge on BSE dropped to 0%. The study agreed that educational intervention program has improved the knowledge on BSE.

Similar study conducted by Jasline (2016) to assess the level of knowledge regarding BSE among school students before and after video assisted teaching. The study reported that majority (63.3%) of the students had inadequate knowledge, 38.3% had moderate knowledge and 18.3% had adequate knowledge before the intervention. After the intervention program, the majority (70%) had improved their knowledge to adequate level. This showed that the level of knowledge increased after the intervention program.

Similar study was conducted by Herman et al. (2015) investigating on the effect of health promotion about BSE for student's knowledge at first senior high school. They reported that the mean score for pre-test knowledge was 59.33 (12.3) and mean score for post-test knowledge was 88.40 (12.3). The increases of the mean score proved that they were agreed that the intervention program is an effective method to improve the knowledge of students on BSE.

The major voting done by participants on the health campaign as the main source for them to get the information regarding BSE proved that this program could improve the knowledge of the participants on BSE. The process of imparting knowledge can occur effectively during this program where participants will gain from effective BSE talk, hands-on teaching on the breast phantom models, other than being able to ask for any doubts they have about BSE. However, due to the cultural background, these girls are defensive to the knowledge of cancer, refusing to call it by its name and have misconceptions on breast cancer which become the barrier for this education (AbdelHadi 2006). Another study by Brown et al. (2017), stated that the perception that participants had enough knowledge on

breast cancer could be a barrier for reception of education on breast cancer. Thus, these barriers need to be addressed so that they feel comfortable to learn about breast health (Brown et al. 2017).

There was no significance difference on knowledge of BSE between participants with family history of breast cancer and without family history of breast cancer ($p = 0.204$). This observation revealed that the knowledge of participants was similar between both groups. The ignorance on breast cancer especially BSE among young women was higher. Some of them know about breast cancer, however, they believe that a very little chance of being diagnosed with breast cancer (Johnson & Dickson-Swift 2008), makes them not aware on this early detection technique (Early et al. 2011). The study reported that the family history of breast cancer were not significantly affect the knowledge of BSE.

There was significance linear relationship between the sources of knowledge gained related to BSE and the post-test knowledge of BSE ($p < 0.001$). The books and journals have the most strongly contribution on the post-test level of knowledge regarding BSE among participants and followed by mass media. This results might be due to during the whole program, they were provided with pamphlets and the content mostly from books and previous journals. This also indicated that the participants that refer the books and journal have better understanding and more knowledge on BSE. A study by Mangen, et al. (2013) revealed that the students who read on paper scored significantly better than those who read the texts digitally because it was easier for those to remember what they had read. It is because touching paper and turning pages aids the memory, making it easier to remember.

Furthermore, according to Wakefield et al. (2010), mass media campaigns can directly and indirectly give positive changes or prevent negative changes in health behaviours. A previous study by Akhtari-Zavare et al. (2014) also claimed that mass media act as the main sources of information on BSE and followed by brochure, friends, doctors and nurses.

Further research could be done incorporating longer duration of intervention session and to assess the long-term effect of educational intervention program on BSE knowledge and its practice.

CONCLUSION

In conclusion, the educational intervention program was found to be an effective method to improve the knowledge on BSE among secondary school girls. Therefore, more intervention program should be implemented on every schools towards improvement of BSE practice and prevention of breast cancer.

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REFERENCES

- Ab Manan, A., Ibrahim Tamin, N. S., Abdullah, N. H., Zainal Abidin, A., & Wahab, M. 2015. Malaysian national cancer registry report 2007-2011: Malaysia cancer statistics, data and figure, age groups and cancers. Putrajaya: National Cancer Institute, Ministry of Health.
- AbdelHadi, M. S. A. 2006. Breast cancer awareness campaign: Will it make a difference? *Journal of Family & Community Medicine* 13(3): 115-118.
- Akhtari-Zavare, M., Ghanbari-Baghestan, A., A Latiff, L., Matinnia, N., & Hoseini, M. 2014. Knowledge of breast cancer and breast self-examination practice among Iranian women in Hamedan, Iran. *Asian Pacific Journal of Cancer Prevention* 15(16): 6531-6534.
- Akhtari-Zavare, M., Juni, M. H., Ismail, I. Z., Md Said, S., & A. Latiff, L. 2015. Barriers to breast self-examination practice among Malaysian female students: a cross sectional study. *Springer Plus* 4(692): 1-6.
- Al-Haji, K. M. & Moawed, S. A. 2015. Breast cancer, breast self-examination knowledge among female high school students in Riyadh City. *Middle East Journal of Nursing* 9(1): 25-7.
- Alharbi, N. A., Alshammari, M. S., Almutairi, B. M., Makboul, G., & El-Shazly, M. K. 2011. Knowledge, awareness, and practices concerning breast cancer among Kuwaiti female school teachers. *Alexandria Journal of Medicine* 48: 75-82.
- American Cancer Society. 2018. American Cancer Society Guidelines for the Early Detection of Cancer. <https://www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines/american-cancer-society-guidelines-for-the-early-detection-of-cancer.html>.
- Brown, N., Smith, J., Brasher, A., Omrani, A., & Wakefield-Scurr, J. 2017. Breast cancer education for schoolgirls: an exploratory study. *European Journal of Cancer Prevention* 27(5): 1-6.
- Burke, K. M., LeMone, P., & Mohn-Brown, E. L. 2007. Medical-surgical nursing care (2nd ed.). Pearson Australia; Prentice Hall.
- Che Mut, N. A. I., Bakar, N. H. A., Kamal, I., Suhaimi, S. A. S., Mohammad, N. M., Ahmad, R., & Zain, N. M. 2018. Breast self-examination among female students: a systematic review. *International Journal of Education and Research* 6(11): 139-150.
- Che Mut, N. A. I., Bakar, N. H. A., Kamal, I., Suhaimi, S. A. S., Mohammad, N. M., Ahmad, R., & Zain, N. M. 2019. Knowledge and awareness of breast self-examination among secondary school girls in Seremban, Negeri Sembilan. *Asian Pacific Journal of Cancer Care* 4(2): 39-43.

- Clinical Practice Guidelines. 2010. Management of breast cancer (2nd ed.): Risk factors. Putrajaya: Health Technology Assessment Section, Medical Development Division, Ministry of Health Malaysia.
- Dey, S., Mishra, A., Govil, J., & Dhillon, P. K. 2015. Breast cancer awareness at the community level among women in Delhi, India. *Asian Pacific Journal of Cancer Prevention* 16(13): 5243-5251.
- Early, J., Armstrong, S. N., Burke, S., & Thompson, D. L. 2011. US female college students' breast health knowledge, attitudes, and determinants of screening practices: new implications for health education. *Journal of American College Health* 59(7): 640-647.
- Gabriel, C. A., & Domchek, S. M. 2010. Breast cancer in young women. *Breast Cancer Research* 12(5): 212-222.
- Hackshaw, A. K., & Paul, E. A. 2003. Breast self-examination and death from breast cancer: a meta-analysis. *British Journal of Cancer* 88(7): 1047-1053.
- Hadi, M. A., Hassali, M. A., Shafie, A. A., & Awaisu, A. 2010. Evaluation of breast cancer awareness among female university students in Malaysia. *Pharmacy Practice* 8(1): 29-34.
- Herman, H., Novriani, H., & Putri, Y. E. 2015. The effect of health promotion about breast self-examination for student's knowledge at the first senior high school of Enam Lingkungan Padang Pariaman. *International Journal of Research in Medical Sciences* 3(10): 2589-2593.
- Hisham, A. N., & Yip, C. H. 2004. Overview of breast cancer in Malaysian women: a problem with late diagnosis. *Asian Journal of Surgery* 27(2): 130-133.
- Jasline, M. 2015. A study to evaluate the effectiveness of video assisted teaching on knowledge regarding breast self-examination among school students at selected school in Madurai District. *Asian Journal of Nursing Education and Research* 6(1): 5-6.
- Johnson, N., & Dickson-Swift, V. 2008. 'It usually happens in older women': young women's perceptions about breast cancer. *Health Education Journal* 67(4): 243-257.
- Keegan, T. H., DeRouen, M. C., Press, D. J., Kurian, A. W., & Clarke, C. A. 2012. Occurrence of breast cancer subtypes in adolescent and young adult women. *Breast Cancer Research* 14(2): R55.
- Komen, S. G., Health, & Training. 2012. Fighting Breast Cancer in Our Community. <https://ww5.komen.org/uploadedFiles/Content/GetInvolved/Events/KomenCHA/Curriculum%20-%20Final%20071912.pdf>.
- Mangen, A., Walgermo, B. R., & Bronnack, K. 2013. Reading linear texts on paper versus computer screen: effects on reading comprehension. *International Journal of Educational Research*, 58: 61-68.
- McPherson, K., Steel, C. M., & Dixon, J. M. 2000. Breast cancer - epidemiology, risk factors, and genetics. *The BMJ* 321(7270): 624-628.
- Norman, P., & Brain, K. 2005. An application of an extended health belief model to the prediction of breast self-examination among women with a family history of breast cancer. *British Journal of Health Psychology* 10(1): 1-16.
- Pope, N. G. 2016. How the time of day affects productivity: Evidence from school schedules. *The Review of Economics and Statistics* 98(1): 1-11.
- Ranasinghe, H. M., Ranasinghe, N., Rodrigo, C., Seneviratne, R. D. A., & Rajapakse, S. 2013. Awareness of breast cancer among adolescent girls in Colombo, Sri Lanka: a school based study. *BMC Public Health* 13(1): 1-7.
- Rosenberg, R. D., Hunt, W. C., Williamson, M. R., Gilliland, F. D., Wiest, P. W., Kelsey, C. A., Linver, M. N. 1998. Effects of age, breast density, ethnicity, and estrogen replacement therapy on screening mammographic sensitivity and cancer stage at diagnosis: review of 183, 134 screening mammograms in Albuquerque, New Mexico. *American College of Radiology* 209(2): 511-518.
- Sapkota, D., Parajuli, P., & Kafle, T. K. 2016. Effectiveness of educational intervention programme on knowledge regarding breast self-examination among higher secondary school girls of Biratnagar. *Birat Journal of Health Sciences* 1(1): 13-19.
- Wakefield, M. A., Loken, B., & Hornik, R. C. 2010. Use of mass media campaigns to change health behaviour. *National Institutes of Health Public Access* 376(9748): 1261-1271.
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