**Original Article**

# Comparison of the Effects of Face-to-Face and WhatsApp Based Training on Adolescent Girls' Health Beliefs about Breast Cancer and Breast Self-Exam

**Nazan Cakirer Calbayram**
**Canakkale Onsekiz Mart University School of Health, Department of Nursing, Canakkale, Turkey**

**Sefika Dilek Guven**
**Nevsehir Hacı Bektas Veli University School of Health, Department of Nursing, Nevsehir, Turkey**

**Correspondence:** Nazan Cakirer Calbayram, Canakkale Onsekiz Mart University School of Health, Department of Nursing, Canakkale, Turkey. e-mail:nazancalbayram@comu.edu.tr

**Abstract**

**Aim:** This study used a pretest-posttest quasi-experimental design and aimed to determine the effects of face-to-face and WhatsApp based training on adolescents' health beliefs about breast self-exam (BSE).

**Methods:** The study consisted of a total of 133 adolescent girls including 72 in the face-to-face training group (FFTG) and 61 in the WhatsApp-based education group (WBTG). Data were collected using a questionnaire form questioning socio-demographic information and breast cancer - BSE-related characteristics, and Champion's Health Belief Model Scale (CHBMS).

**Results:** The mean age of the girls was $15.77 \pm 0.61$. While 26.4% of the students in FFTG and 37.7% of those in WBTG had a family history of cancer, 6.9% of the students in FFTG and 13.1% of those in WBTG had breast cancer history in their family. The mean scores for the perception of susceptibility, seriousness, benefit, confidence, and health motivation in WBTG were higher compared to those of FFTG.  Furthermore, the mean score for barriers was determined to be lower in WBTG compared to that of FFTG.

**Conclusions:** According to this result of the study, it can be recommended that training on breast cancer and BSE can be given through WhatsApp.

**Keywords:**  breast cancer; breast self-exam; adolescent; face-to-face training; whatsapp; based training, nursing

## Introduction

Cancer is one of the major health problems that threaten the world today. According to the World Health Organization (WHO), cancer is the second most leading cause of death in the world and is responsible for an estimated 9.6 million deaths in 2018. Globally, cancer accounts for nearly 1 in 6 deaths (WHO, 2018). Besides, cancer (20.7%) is the second most frequent cause of death in Turkey after circulatory system diseases (40.4%) in the ranking of known causes of death (The Turkish Statistical Institute, 2014)

According to 2017 data of the Ministry of Health, the age-standardized cancer rate in Turkey in 2014 was 173.6 out of hundred thousand in women. The five most common types of cancer diagnosed among women in 2014 were listed as breast, thyroid, colorectal, uterine corpus, and lung cancer. Breast cancer is the most common cancer type in women across the world (46.3%) and Turkey (24.9%) (The Ministry of Health of Turkey, Public Health Institution. 2017; Globacan, 2018). One out of four diagnosed cancers in women in Turkey is breast cancer. In our country, 25.5% of women diagnosed with breast cancer fall into the 50-69 age range, 34.1% into the 25-49 age range, and 4.5% into the 15-24 age range (Globacan, 2018).

Breast cancer mortality and incidence increase at the age of 35 and older. Prognosis of breast cancer in young women has been reported to be worse than in the elderly (Zhang, 2015). Advances and improvements in early diagnosis

and treatment decrease the mortality rates of breast cancer, especially in the young age group (Ferguson, 2013). Early diagnosis means making a diagnosis of the disease at a time when there is a chance for the disease to be treated within the natural process. Breast self-examination (BSE) is the examination of breasts so that women can recognize their breast structures and notice any changes in their breasts at an early stage. Although no serious breast lesions have been observed in adolescents, girls should learn about BSE. This will enable early detection of galactorrhea and abnormal breast growth (Arca, 2004). BSE, which is an economical and easy-to-apply method for every woman, is a technique that is specially developed to search for cancer, different from simply touching the breast (Akyolcu, 2011). It also helps people to take responsibility for their own health (Semiglazov, 1987). BSE skill should be adequately emphasized in terms of enabling women to recognize their own body and cancer early. Besides, considering that mammography is not actively employed, and clinical breast examination is rarely performed in very young women, BSE generally functions as the only diagnostic method in early diagnosis, and its importance in this age group increases even more (Sorensen, 2003). Although BSE is a kind of personal exercise, raising awareness of this responsibility in individuals is the primary duty of nurses working in health services.

## Methods

**Aim and design of the study:** The study used a pretest-posttest quasi-experimental design and aimed to determine the effect of face-to-face training and WhatsApp-based training on adolescents' beliefs about BSE application.

**Setting and participants:** The study was carried out in a high school in a province in the Central Anatolia Region of Turkey between 1 -29 December 2017. The sample size of the study was calculated with the GPower 3.1 statistical software package based on 80% power. The minimum sample size was determined to be 56 participants in FFTG and 56 participants in WBTG. In the study, 150 adolescent girls matching the inclusion criteria were listed according to their school numbers. They were divided into two groups of 75 students using simple random numbers table. FFTG and WBTG were determined by drawing lots. The study was completed with a total of 133 adolescent girls, including 72 in FFTG and 61 in WBTG.

**Inclusion criteria:** For WhatsApp-Based Training Group, the criteria included at least a year-long menstruation history, parental and personal consent for participation in the study, having WhatsApp access, participation in all WhatsApp activities during the training, and filling out CHBMS fully. For Face-to-Face Training Group, the criteria included at least a year-long menstruation history, parental and personal consent for participation in the study, participation in face-to-face training activities, and filling out CHBMS fully.

**Instruments of measurement:** The data were collected with CHBMS and a questionnaire form questioning socio-demographic characteristics, breast cancer, and BSE-related characteristics.

**Champion's Health Belief Model Scale (CHBMS):** The scale was developed by Champion in 1984. CHBSM was adapted to Turkish in three different studies in Turkey (Gozum, 2004; Karayurt, 2007; Seçginli, 2004). In this study, the Turkish form of CHBSMS that was adapted by Gozum and Aydin (2004) was used. This self-completed scale consists of 43 items which are clustered into 6 subscales: susceptibility (3 items), seriousness (7 items), benefits (5 items), barriers (11 items), confidence/self-efficacy (10 items), and health motivation (7 items). Respondents answer items on a five-point Likert-type scale ranging from 1 to 5 (1= strongly disagree, 2= disagree, 3=neutral, 4= agree and 5= strongly agree). Minimum and maximum scores that can be obtained from the scale are 43 and 215, respectively. Also, the minimum and maximum scores that can be obtained from the subscales are as follows: 3-15 from susceptibility; 7-35 from seriousness; 5-25 from benefits; 11-55 from barriers; 10-50 from confidence/self-efficacy, and 7-35 from health motivation. Higher scores indicate stronger feelings related to that construct. Cronbach's alpha values range between 80 and 93. In this study, Cronbach's alpha value varied by 0.78 and 0.76

**Data Collection Procedures- Procedures for WhatsApp group:**

1. The students were administered the questionnaire form collecting socio-demographic

information, and breast cancer and BSE-related characteristics and CHBMS.

2. BSE-related training content was shared on WhatsApp, and the students were given two weeks. The researchers monitored the students whether they followed the content of the training.

3. Students' questions about BSE were answered on WhatsApp.

4. Two weeks after the training content about BSE was shared through WhatsApp, all students participating in WhatsApp activities were administered CHBMS.

**Procedures for face-to-face training group:**

1. The students were administered the questionnaire form collecting socio-demographic information, and breast cancer and BSE-related characteristics and CHBMS.

2. BSE-related training content was given to the students in a face-to-face training session.

3. Two weeks after the training content about BSE was provided to the students through face-to-face training, all students participating in face-to-face training were administered CHBMS.

**Data analysis:** The findings obtained in the study were analyzed with IBM SPSS Statistics 22 (IBM SPSS, Turkey) software package using mean, standard deviation, frequency, Student's t-test, Mann-Whitney U test, and Wilcoxon signed-rank test. The significance level was accepted as $p < 0.05$.

**Ethical Considerations:** To conduct the study, ethical approval of the ethics committee of the related university (Decision date: 05.12.2017, Decision no: 2017.12.03) and the permission of the high school where the study was carried out were obtained. The purpose of the study was explained to the students and their parents, and their consent was obtained by paying attention to the voluntary principles. The students filled out the pretest and posttest data collection forms by writing aliases without specifying their names.

**Results:** The mean age of the girls was $15.77 \pm 0.61$ (min.: 15 – max.: 17) and 88.9% of the FFTG and 98.4% of the WBTG were found to have social insurance. In general, the participants perceived their income status as equal income and expenses. Also, the age of menarche was 13 or older in 52.8% of adolescents in FFTG, while it was 10-12 in 72.1% of those in WBTG. As for the time since first menstruation, it was 1-3 years in 73.6% of the adolescents in FFTG and 4 years and over in 75.4% of the adolescents in WBTG (Table 1).

In the study, the examination of the status of breast cancer history in students' family indicated that 26.4% in the FFTG and 37.7% in the WBTG had cancer history in their family, and 6.9% in FFTG and 13.1% in WBTG had breast cancer history in their family. Only 19.4% of the FFTG adolescents and 23% of the WTEG adolescents were found to have received information about breast cancer, and they were determined to receive this information from mass media, mother-aunt-relative, and doctor-nurse-midwife, respectively. Very few of the students (5.6% in FFTG and 6.6% in WBTG) stated that they knew BSE and that they received this information from TV, magazines, the Internet, newspapers, nurses, and friends/relatives. As for the application of BSE, 6.9% of FFTG students and 31.1% of WTEG students stated that they performed BSE and that they generally performed it whenever they remembered it (Table 2).Table 3 shows the distribution of mean post-training scores of FFTG and WBTG for the sub-dimensions of CHBMS. The means scores of WBTG for susceptibility, seriousness, benefits, confidence/self-efficacy, and health motivation sub-dimensions were found to be higher than those of FFTG. Also, the mean score for barriers sub-dimension was found to be lower in the WBTG compared to that of FFTG.The comparison of FFTG and WBTG indicated that the difference between the mean susceptibility scores was significant ($p < 0.05$).

**Table 1. Distribution of FFTG and WBTG by Personal Characteristics**

| Characteristics | FFTG (n:72) | | WBTG (n:61) | |
|---|---|---|---|---|
| | n | % | n | % |
| **Social Insurance** | | | | |
| Yes | 64 | 88.9 | 60 | 98.4 |
| No | 8 | 11.1 | 1 | 1.6 |
| **Income** | | | | |
| Income is higher than expenses | 9 | 12.5 | 5 | 8.2 |
| Equal income and expenses | 54 | 75.0 | 55 | 90.2 |
| Lower income than expenses | 9 | 12.5 | 1 | 1.6 |
| **Age of menarche** | | | | |
| 10-12 | 34 | 47.2 | 44 | 72.1 |
| 13 and older | 38 | 52.8 | 17 | 27.9 |
| **Time since the first menstruation** | | | | |
| 1-3 years | 53 | 73.6 | 15 | 24.6 |
| 4 and above | 19 | 26.4 | 46 | 75.4 |

**Table 2. Breast cancer and BSE-related characteristics of the adolescent girls in FFTG and WBTG**

| Breast cancer and BSE-related characteristics | FFTG (n:72) | | WBTG (n:61) | | Total | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| **Cancer history in the family** | | | | | | |
| Yes | 19 | 26.4 | 23 | 37.7 | 42 | 31.6 |
| No | 53 | 73.6 | 38 | 62.3 | 91 | 68.4 |
| **Breast cancer history in the family** | | | | | | |
| Yes | 5 | 6.9 | 8 | 13.1 | 13 | 9.8 |
| No | 67 | 93.1 | 53 | 90.2 | 120 | 90.2 |
| **Has information about breast cancer** | | | | | | |
| Yes | 14 | 19.4 | 14 | 23.0 | 28 | 21.1 |
| No | 58 | 80.6 | 47 | 77.0 | 105 | 78.9 |
| **Source of the breast cancer-related information*** | | | | | | |
| Mother-aunt-relative | 5 | 6.9 | 4 | 6.6 | 9 | 32.1 |
| Physician-nurse-midwife | 4 | 5.6 | 1 | 1.6 | 5 | 17.9 |
| Mass media | 6 | 8.3 | 10 | 16.4 | 16 | 57.1 |

| Friend | 1 | 1.4 | 3 | 4.9 | 4 | 14.3 |
|---|---|---|---|---|---|---|
| **Knowing BSE** | | | | | | |
| Yes | 4 | 5.6 | 4 | 6.6 | 8 | 6.0 |
| No | 68 | 94.4 | 57 | 93.4 | 125 | 94.0 |
| **Source of BSE-related information*** | | | | | | |
| Friend/relative | 1 | 1.4 | 2 | 3.3 | 3 | 37.5 |
| Doctor | 1 | 1.4 | 1 | 1.6 | 2 | 25.0 |
| Nurse | 1 | 1.4 | 2 | 3.3 | 3 | 37.5 |
| TV, magazines, the Internet, newspaper | 2 | 2.8 | 5 | 8.2 | 7 | 87.5 |
| **Applying BSE** | | | | | | |
| Yes | 5 | 6.9 | 19 | 31.1 | 24 | 18.0 |
| No | 67 | 93.1 | 42 | 68.9 | 109 | 82.0 |
| **Frequency of BSE** | | | | | | |
| When I remember it | 5 | 6.9 | 11 | 18.0 | 16 | 66.7 |
| Before menstruation period | - | - | 2 | 3.3 | 2 | 8.3 |
| During menstruation period | - | - | 1 | 1.6 | 1 | 4.2 |
| On the 1st day of each month | - | - | 1 | 1.6 | 1 | 4.2 |
| 5-7 days after menstruation period | - | - | 4 | 6.6 | 4 | 16.6 |

*Multiple answers were supplied.

**Table 3. Comparison of mean pre- and post-training total CHBMS scores and Subscalescores of Adolescent Girls in FFTG and WBTG**

| CHBMS Subscales | FFTG (n:72) | | WBTG (n:61) | | Z | P |
|---|---|---|---|---|---|---|
| | Pre-training X ±SS | Post-training X ±SS | Pre-training X ±SS | Post-training X ±SS | | |
| **Susceptibility** | 8.25±4.02 | 9.01±1.26 | 8.45±2.11 | 9.59±1.83 | - 2.133 | 0.035 |
| **Seriousness** | 20.34±5.15 | 21.29±4.57 | 21.42±5.03 | 22.49±4.66 | -1.493 | 0.138 |
| **Benefits** | 19.02±5.35 | 21.09±4.69 | 19.83±5.07 | 22.18±3.29 | -1.514 | 0.133 |
| **Barriers** | 28.48±6.29 | 26.00±6.70 | 26.72±6.98 | 25.29±5.57 | -0.652 | 0.516 |
| **Confidence/self-efficacy** | 28.12±5.93 | 36.97±5.30 | 28.91±6.87 | 36.47±7.24 | -0.018 | 0.986 |
| **Health motivation** | 25.81±5.08 | 25.97±5.17 | 25.62±4.26 | 26.24±4.51 | -0.439 | 0.660 |

## Discussion

This study aimed to determine the effect of face-to-face and WhatsApp-based training on adolescent girls' beliefs about breast cancer and BSE. The mean age of the adolescent girls who participated in the study was 15.77 years. In breast cancer, the female gender is the highest risk factor and it represents a 100-fold increased risk. Apart from the female gender, another high-risk factor is progressing age (National Comprehensive Cancer Network. 2009). However, the age of breast cancer has started to fall in recent years. An 8-year-old girl in the US and a 9 year-old-girl in Turkey were diagnosed with breast cancer (Cumhuriyet, 2013; The Ministry of Health of Turkey Health Statistics Yearbook 2014).

Cancer is a growing health problem worldwide, and it causes a significant socioeconomic burden in societies and material and moral losses and difficulties in individuals. According to the newly released world cancer statistics, cancer ranks first among the causes of deaths In Turkey, it is the second leading cause of death among the known causes of death (The Ministry of Health of Turkey Health Statistics Yearbook, 2014). One of the risk factors in breast cancer development is familial/genetic factors (family history, known or suspected BRCA1 / 2, p53, PTEN, or other gene mutations associated with breast cancer risk) (National Comprehensive Cancer Network, 2009). One-third of the adolescent girls who participated in the study were found to have cancer in their family, and approximately 10% of them had a history of breast cancer. These reasons lay out the fact that raising awareness about breast cancer in adolescents is important.

In the study, only one-fifth of adolescent girls were found to have received information about BSE and the majority (94.0%) did not know how to perform the breast self-exam. Most of the adolescent girls who stated that they had received information about BSE stated that they had obtained this information from TV, magazines, the Internet, and newspapers (Table 2). According to the 2014 report of the Health Statistics Yearbook of the Ministry of Health, 65.1% of women aged 18 and over in Turkey had never performed BSE, while 10.1% were reported to perform it once a month (The Ministry of Health of Turkey Health Statistics Yearbook, 2014). Although these results are common, women's awareness of breast cancer is quite low. Turkmen (2017) determined that 34.6% of the students knew how to perform BSE, 14.3% knew when to perform it, and that 14.1% performed it once a month (Turkmen, 2017). Bektas et al. (2014) discovered that 54.8% of the students had received education about BSE previously, 85.6% did not have enough information about BSE, 74% had not performed BSE, and that 62% did not know how to apply BSE (Bektas, 2014). In their study, Beydag and Karaoglan (2007) found that 58.0% of the students had not received information about breast examination and that 69.5% had not performed BSE before (Beydag, 2007). Karasu et al. (2017) reported that 28.1% of the students attending health schools had received information about BSE, 11.1% of those who had received information had obtained it from health personnel, 10.4% from television, radio or the Internet, and 7.4% from books, magazines or brochures (Karasu, 2017). In the study, very few adolescents were found to perform BSE (18.0%), and more than half (83.4%) of the adolescents were determined to have been performing the examinations at wrong times (Table 2). Karasu et al. (2017) determined in a study conducted with 135 students that only 3 students had been performing BSE at right times (Karasu, 2017). These results suggest that access to educational resources and awareness-raising studies are not enough.The mean post-training scores of the adolescents participating in the study obtained from susceptibility, seriousness, perception of benefits, confidence, and health motivation sub-dimensions were determined to have increased in both groups compared to the pre-training evaluations (Table 3). The increase in the mean post-training scores is an indication that the training will increase the rate of performing BSE applications. The mean post-training scores obtained from the perception of barriers were found to fall in both groups in comparison to pre-training evaluations (Table 3). According to the Health Belief Model, the lower the perception of barriers is, the higher the likelihood of adopting the behavior is (Nahcivan, 2003). Results in the literature were found to be like those of the present study (Beydag, 2007; Karasu, 2017). In line with these results, we can say that training decreases the perception of barriers and that the likelihood of starting the behavior may increase.In the study, the mean post-training scores of the WBTG regarding susceptibility,

seriousness, benefits, confidence, and health motivation perceptions were determined to be higher than the FFTG. Besides, the mean score for barriers was found to be lower in the WBTG compared to that of the FFTG (Table 3). These results may suggest that providing training to adolescents in the Internet medium and on a regular base will raise awareness more.

**Conclusions;** The results of the present study conducted to determine the effect of face-to-face training and WhatsApp-based training on breast cancer and BSE beliefs of adolescent girls revealed that WhatsApp-based training did not demonstrate dramatically different results compared to the face-to-face training. We think WhatsApp-based training was a viable alternative and good option to the face-to-face training, and in some aspects maybe even slightly better than conventional education. It is ok to conclude that the WhatsApp-based training is good and helpful, but not perfect. WhatsApp-based training has some advantages - such as it gives students flexibility when and where they can study, they can review material as needed, but access to technology and technical issues may at times hinder the learning.

## References

Arca, M., Caniano, D. (2004). Breast disorders in the adolescent patient. *Adolescent Medicine Clinics*, 15(3):473-85.

Akyolcu, N., Altun Ugras, G. (2011). Breast Self Examination: How Important is it in Early Diagnosis? The Journal of Breast Health, 7:1. http://www.thejournalofbreasthealth.com/sayilar/22/buyuk/2331.pd

Bektas, M., Ilya,Os., Kusbeci, S., Bektas, I. (2014). Nursing students' knowledge and practice about breast-testicularself -examination and hpv vaccine. Yildiri Beyazit University Faculty of Health Sciences Nursinig E-Journal,2(2):1-11.

Beydag, D., Karaoglan, H. (2007). The effect of breast self-examination education on students' knowledge and attitudes. TAF Preventive Medicine Bulletin, 6 (2):106-111.Cumhuriyet. 2013. Breast cancer is catching earlier now. http://www.cumhuriyet.com.tr/haber/diger/422130/Meme_kanseri_artik_daha_erken_yakaliyor.html. Accessed 15 September 2019.

Ferguson, NL., Bell, J., Heidel, R., Lee, S., Vanmeter, S., Duncan, L., Munsey, B., Panella, T., Orucevic, A. (2013). Prognostic value of breast cancer subtypes, Ki-67 proliferation index, age, and pathologic tumor characteristics on breast cancer survival in Caucasian women. *Breast J.* 19:22-30. https://www.ncbi.nlm.nih.gov/pubmed/23240985.

Gozum, S., Aydin, I. (2004). Validation evidence for Turkish adaptation of Champion's Health Belief Model Scales. *Cancer Nursing,* 27(6):491-8. https://www.ncbi.nlm.nih.gov/pubmed/15632789.

Globacan. Cancer Today, Data visualization tools for exploring the global cancer burden in 2018. http://gco.iarc.fr. Accessed 01 October 2019.

Karayurt, O., Dramali, A. (2007). Adaptation of Champion's Health Belief Model Scale for Turkish Women and Evaluation of the Selected Variables Associated with Breast Self-Examination. *Cancer Nursing,* 30(1):69-77.

Karasu, F., Golluce, A., Guvenc, E., Polat, F., Delibas, L., Bayir, B., Gulcek, E., Gokdogan, U. (2017). The effectiveness of the education about breast cancer given to students at a foundation university. Mersin University Journal of Health Sciences, 10(1):14 – 24.

Nahcivan, ON., Secginli, S. (2003). Attitudes and Behaviors towards Early Diagnosis of Breast Cancer;

Using the Health Belief Model as a Guide. Journal of Cumhuriyet University School of Nursing, 7: 33-37.National Comprehensive Cancer Network. 2009. Clinical Practice Guidelines in Oncology. *Breast                     Cancer.* https://www.nccn.org/professionals/physician_gls/default.aspx. Accessed 05 September 2019.

Secginli, S., Nahcivan, NO. (2004). Reliability and validity of the Breast Cancer Screening Belief Scale among Turkish women. *Cancer Nursing,* 27(4), 287-294.

Semiglazov, VF., Moiseenko, VM. (1987). Breast self-examination for the early detection of breast cancer: a USSR/WHO controlled trial in Leningrad. Moiseenko. *Bulletin of the World Health Organization*, 65(3):391-396.

Sorensen, J., Hertz, A. (2003). Cost-effectiveness of a systematic training programme in breast self-examination. *Eur J Cancer Prev,* 12(4):289-94. The Turkish Statistical Institute, 2014. Causes of Death                                 Statistics. http://www.tuik.gov.tr/PreHaberBultenleri.do?id=18855. Accessed 28 September 2019

The Ministry of Health of Turkey, Public Health Institution. 2017. Cancer Istatistics. https://hsgm.saglik.gov.tr/depo/birimler/kanser-db/istatistik/2014-RAPOR._uzuuun.pdf. Accessed 05 September 2019.

The Guardian. 2015. Eight-year-old Utah girl diagnosed with rare form of breast cancer. https://www.theguardian.com/us-news/2015/nov/24/eight-year-old-utah-girl-breast-cancer-chrissy-turner. Accessed 15 September 2019.

The Ministry of Health of Turkey Health Statistics Yearbook 2014. https://dosyasb.saglik.gov.tr/Eklenti/5119,yilliktrpdf.pdf?0. Accessed 10 September 2019.

Turkmen, H. (2017). University Knowledge and Practice of Breast Self-Examination. Celal Bayar University Journal of University Sciences Institute, 4 (2), 586-592.

Zhang, Q., Ma, B., Kang, MA. (2015). Retrospective comparative study of clinicopathological features between young and elderly women with breast cancer. *Int J ClinExpMed,* 8:5869- 5875.

World Health Organization (WHO). 2018. Cancer. https://www.who.int/news-room/fact-sheets/detail/cancer. Accessed 01 October 2019