



From Screen to Awareness: Video-Based Nutrition Education for Breast Cancer Prevention Among Adolescent Girls

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ABSTRACT

Background: Breast cancer is still one of the most common and lethal cancers impacting women worldwide. With early-onset cases gradually increasing over the last decade, and given that teenage dietary and lifestyle habits have a significant impact on long-term cancer susceptibility, it is critical to address the present gaps in nutritional understanding and preventative approaches among this age group. This study examined the efficacy of video-based nutrition education in improving adolescent girls' awareness and attitudes about breast cancer prevention at SMA Negeri 4 Medan.

Methods: The study used a pre-experimental, one-group pre-test and post-test design and included 83 female students from Grades X and XI, selected using purposive sampling. Data were acquired using approved questionnaires and analyzed statistically using the Paired sample t-test.

Results: The educational intervention produced a considerable favorable outcome. The participants' average knowledge score significantly increased from 61.45 ± 6.77 to 89.35 ± 6.31 ($p=0.000$). Similarly, the average attitude score increased from 77.43 ± 10.18 to 87.30 ± 8.68 ($p=0.000$).

Conclusion: Delivering nutrition education through video presentations was followed by a significant increase in teenage females' knowledge and proactive attitudes toward breast cancer prevention.

Keywords: *Breast Cancer; Female; Knowledge; Nutrition Education; Video*

INTRODUCTION

Cancer poses a major challenge to global public health.^[1] Worldwide, breast cancer (BC) is the most frequently diagnosed malignancy in women, with cervical cancer following closely behind.^[2] Given its extremely high

prevalence, BC is a major driver of international cancer incidence and is the leading cause of cancer-related death in the female population.^[3] Even with continued improvements in diagnostic screening and therapeutic interventions, BC remains the second leading cause of

cancer-related death worldwide, second only to lung cancer.^[4]

Breast cancer now accounts for 36% of all cancers, and its incidence continues to increase over time. An estimated 2,089 million women received a new diagnosis of the disease in 2018.^[5] Globally, more than 2.2 million individuals were newly diagnosed in 2020.^[6] In Asia, breast cancer accounts for approximately 985,400 new cases, with a projection of reaching 1.4 million by 2050.^[7] Approximately 66,000 new cases were reported, making it the most common cancer in Indonesia.^[8] While it has traditionally been a long-standing myth that breast cancer primarily affects adults, recent evidence suggests that young adults are also at risk and often develop more aggressive forms of breast cancer.^[9] The number of breast cancer cases in young women worldwide has nearly doubled over the past three decades, increasing by 89.27% from 89,174.14 cases in 1990 to 168,775.84 in 2019.^[10]

Breast cancer develops when malignant cells form within breast tissue. These cancer cells exhibit uncontrolled proliferation, resulting in abnormal tissue growth known as carcinoma in situ.^[11] Over time, these cells can gain the ability to invade surrounding healthy tissue, thus developing into invasive breast cancer.^[12] This complex process is influenced by genetic, hormonal, physiological, environmental, and lifestyle factors.^[13] Understanding these underlying mechanisms is essential for developing effective preventive and educational strategies to reduce breast cancer risk.

Considering its multifactorial causes, breast cancer requires preventive strategies and education. Nutrition and health education are key strategies to reduce breast cancer risk by raising awareness, promoting healthy lifestyles, and supporting early detection^[14], including the use of video media.^[15] Previous studies have shown that video-based interventions effectively enhance

breast cancer awareness in terms of knowledge, attitudes^[16], and practices.^[17] Similar studies have reported that short video viewing improves knowledge that promotes breast cancer literacy, largely due to audience interest in visual infographics and better information retention.^[18]

Given the increasing prevalence of breast cancer and its multifactorial etiology, implementing effective prevention strategies is crucial. A potentially effective strategy to increase public awareness and support early detection techniques is providing nutrition and health education using video-based media. The purpose of this study was to evaluate how well video-based educational treatment can improve health outcomes for young women who have been classified as at risk for breast cancer.

METHODS

An intervention design based on a one-group pre-test and post-test methodology was used in this investigation. In March 2020, the study was carried out at SMA Negeri 4 Medan. Active female students enrolled at SMA Negeri 4 Medan made up the study population. Five distinct classes made up the sample. The sample was chosen using a purposive sampling strategy combined with a non-probability sampling method. Eighty-three teenage female pupils made up the computed sample size. The research tool was a validated questionnaire. Over the course of three sessions, nutrition education was provided using video-based instructional materials as part of the intervention. By comparing the mean scores before and after the intervention, the knowledge and attitudes of the students were evaluated. The Paired T-test statistical approach was used to examine the gathered data.

RESULT

Subject characteristics

The baseline characteristics of the 83 participants are compiled in Table 1. All participants in this study were female students (100%).

Table 1. Subject characteristics

Characteristic	Frequency (n)	Percentage (%)
Age		
14 years	28	33.7
15 years	45	54.2
16 years	10	12.1
Sex		
Female	83	100
Class		
X	41	49.4
XI	42	50.6
Family history of cancer		
Yes	1	1.2
No	82	98.8
Prior knowledge of breast cancer		
Yes		
No.		
Healthy lifestyle behavior		
Adopted	5	6
Not Adopted	78	94
Total	83	100

(Source: Primary Data, 2020)

The majority of the students were 15 years old (54.2%), followed by 14 years old (33.7%) and 16 years old (12.1%). The distribution between classes was almost equal, with 49.4% from Grade X and 50.6% from Grade XI. Furthermore, nearly all participants (98.8%) reported having no family history of cancer, 91.6% had no prior knowledge of breast cancer, and a vast majority (94.0%) had not adopted healthy lifestyle behaviors prior to the intervention.

Pre-Intervention Student Attitudes and Nutrition Knowledge

The nutrition education content, delivered through a video format, focused on nutrition and breast cancer risk. Before the intervention, students demonstrated a moderate level of nutrition knowledge,

with fewer than 15 out of 25 questions answered correctly, equivalent to 61.45% of the total correct responses (Figure 1). Specifically, only approximately 40% of the students were aware of dietary components and their role in breast cancer prevention. Nevertheless, the majority of students understood the importance of nutrition in the prevention of breast cancer.

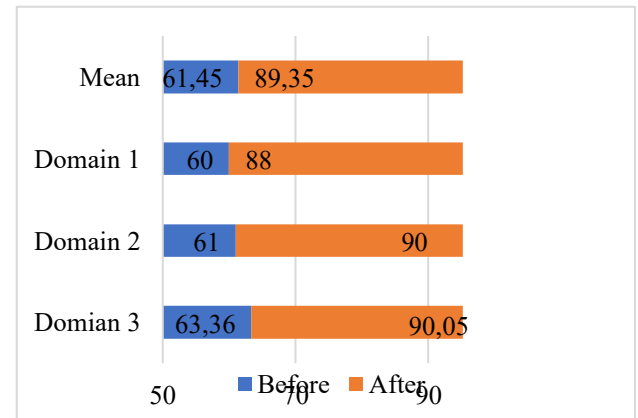


Figure 1. Percentage of nutrition knowledge

The standard nutrition knowledge questionnaire was systematically designed to cover three key domains: (1) basic concepts of breast cancer, (2) dietary factors associated with breast cancer risk, and (3) lifestyle behaviors related to prevention. As illustrated in Figure 1, the video intervention yielded a substantial increase in the students' understanding across all areas. Notably, the most prominent improvement was observed in Domain 3 (lifestyle behaviors), which surged from 63.36 to 90.05. Similarly, Domain 1 and Domain 2 demonstrated marked increases of nearly 30 points. These consistent improvements across all categories underscore the comprehensive impact of the video-based educational materials.

As presented in Table 2, the nutrition education intervention was associated with improved knowledge and attitudes toward nutrition among the participants. Based on the pre- and post-test results from 83 respondents, the mean

score for nutrition knowledge increased markedly from 61.45 ± 6.77 to 89.35 ± 6.31 (p-value 0.000). In addition to cognitive improvements, the intervention was followed by a significant increase in participants' attitudes toward nutrition. The mean score for nutrition attitudes rose from 77.43 ± 10.18 in the pre-test to 87.30 ± 8.68 in the post-test (p-value 0.001).

Table 2. Variations in attitudes and knowledge about nutrition before and after education (n=83)

Variables	Education (Mean $\pm$ SD)		p-value
	Pre-test	Post-test	
Nutrition knowledge	61.45 ± 6.77	89.35 ± 6.31	0.000
Nutrition attitudes	77.43 ± 10.18	87.30 ± 8.68	0.000

DISCUSSION

The study's findings show that the nutrition education program was associated with improved knowledge and attitudes toward nutrition among the participants. This finding supports earlier studies indicating that structured, classroom-based cancer prevention education effectively enhances adolescents' dietary behaviors and their understanding of health-related topics.^[19] Consistent with these findings, other research has also shown that nutrition-focused interventions contribute to increased awareness and adoption of dietary practices that are aligned with cancer prevention strategies.^[20] A meta-analysis further strengthened this trend by revealing a significant overall increase in nutrition knowledge among participants who received education specifically related to cancer prevention.^[21]

Apart from the educational content itself, the media for conveying information seems to play an important role.^[22] In this study, the use of video-based learning media was found to be positively associated with improved students' nutritional knowledge. These

results reinforce previous findings that audiovisual tools, particularly educational videos, are effective in improving learning outcomes in nutrition education, particularly among school-age populations.^[23] Previous research comparing video-based learning with traditional print materials found that participants exposed to videos reported significantly higher levels of interest and found the content easier to understand.^[24] The engaging and visually stimulating nature of videos can enhance learners' attention, comprehension, and retention, thereby increasing the overall effectiveness of educational interventions.^[25]

The results of this study add to the body of data showing how effective video-based health education is in shaping healthy attitudes. Specifically, educational videos focusing on healthy dietary practices for breast cancer prevention have shown a significant impact on improving individuals' awareness, risk perception, and behavioral intentions.^[26] These observed effects can be explained through several theoretical frameworks. The Health Belief Model^[27], states that people are more likely to adopt preventive behaviors when they believe in the benefits of the recommended action, feel a high level of sensitivity to a disease, and are aware of the seriousness of its impact.^[28] Video makes it easier to convey complex health information in a more accessible way, especially through the use of animation, infographics, and simulations.^[29] It also allows for the presentation of real-life stories, patient testimonies, or emotionally evocative dramatizations. Emotional engagement often triggers attitude change.^[30] Videos depicting positive outcomes of healthy behaviors can improve individuals' attitudes by strengthening their sense of self-efficacy—the belief that they are capable of adopting these behaviors and that doing so is beneficial.^[31] This sense of self-efficacy and perceived value plays

an important role in forming and maintaining positive health attitudes.^[32]

Thus, it is hoped that the results of this study can be the basis for creating a more successful nutrition education program in preventing breast cancer in adolescents. However, we acknowledge the limitation of utilizing a pre-experimental one-group pre-test and post-test design without a control group. While a significant increase in knowledge and attitude scores was observed, the absence of a control group limits the ability to conclusively isolate the video intervention from other external confounding variables. Therefore, future studies incorporating a Randomized Controlled Trial (RCT) design are highly recommended to further confirm these findings and minimize the potential influence of confounding variables.

CONCLUSION

Nutrition education offered through video media helped improve adolescent girls' knowledge and attitudes about breast cancer prevention. Future research should explore the effectiveness of integrating video-based media with interactive interventions, while also considering broader study populations and settings to enhance the generalizability and applicability of the findings.

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