



Impact of KALDARI Education on Knowledge and Attitudes Toward Early Breast Cancer Detection



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ABSTRACT

Aims This study aimed to evaluate the effectiveness of an innovative educational tool, the SADARI Calendar (KALDARI), in improving the knowledge and attitudes of women of reproductive age regarding breast self-examination in the working area of the Public Health Center of Selatpanjang.

Materials & Methods This quasi-experimental study used a one-group pre-test-post-test approach and was conducted on 63 women aged 30-50 years selected using purposive sampling. Data were collected using structured questionnaires administered before and after the KALDARI education sessions, which included lectures and demonstrations of SADARI techniques. Descriptive and inferential analyses were conducted, with paired t-tests used to assess significant differences in respondents' knowledge and attitudes before and after the intervention.

Findings There was a significant increase in mean knowledge scores, from 7.76 ± 2.85 to 9.88 ± 2.77 ($p=0.0001$), and in attitude scores, from 8.47 ± 2.31 to 11.28 ± 2.38 ($p=0.0001$). These results demonstrated the effectiveness of the KALDARI educational tool in enhancing knowledge and fostering positive attitudes toward early breast cancer detection.

Conclusion The KALDARI educational intervention is effective in improving respondents' knowledge and attitudes regarding the importance of early breast cancer detection through self-examination (SADARI).

Keywords Attitude; Breast Cancer; Early Detection of Disease; Health Education

CITATION LINKS

[1] Epidemiological characteristics of and risk factors for breast cancer ... [2] Breast cancer epidemiology and ... [3] Breast cancer risk from modifiable and nonmodifiable risk factors among white women ... [4] Cancer today ... [5] Exploring the why: Risk factors for HIV and barriers to sexual and reproductive health service ... [6] Indonesia's health profile ... [7] Is it important to detect breast cancer early? ... [8] Health profile of Riau province ... [9] 2023 risked report ... [10] Breast cancer screening in developing ... [11] Screening for breast ... [12] International evaluation of an AI system for breast ... [13] The effect of health education with videos on knowledge ... [14] The effectiveness of health education with lecture and audiovisual methods to improve knowledge and attitude about BSE ... [15] The effectiveness of health promotion through audio visuals and leaflets about awareness (breast self-examination) in increasing adolescent girls' knowledge ... [16] The effectiveness of health promotion through audio visuals and leaflets ... [17] Increased breast cancer knowledge and breast self-examination ... [18] The effectiveness of awareness education (breast self-examination) for early ... [19] Comparison of the effectiveness of health education using leaflets and audio-visual ... [20] Modification of breast self-examination behavior through the ... [21] The use of a calendar in assessing behaviour change of women ... [22] Health awareness campaigns and diagnosis rates ... [23] Cancer, prevention, research and the ... [24] Designing a breast health application as a medium for information ... [25] Knowledge and application-based awareness behavior for early ... [26] Mobile learning for early detection ... [27] Experience as the base for ... [28] Understanding the massive open online course (MOOC) student experience ...

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Introduction

Cancer is one of the leading non-communicable diseases, contributing significantly to the global health burden [1, 2]. It is characterized by the uncontrolled growth of abnormal cells with the ability to invade and spread to other tissues in the body [3]. According to the World Health Organization (WHO), cancer remains one of the primary causes of death worldwide [4]. The number of cancer-related deaths is projected to rise, potentially exceeding 13.1 million by 2030 [5].

In Indonesia, cancer represents a significant public health concern, with a prevalence of 136.2 cases per 100,000 population. Among various types of cancer, breast cancer accounts for the highest number of cases, totaling 348,809. Of these, 58,256 cases, or 16.7%, are the primary cause of death among women. Globally, breast cancer is the second leading cause of death in women. In Indonesia, the prevalence of breast cancer reaches 42.1 cases per 100,000 population, with an average mortality rate of 17 deaths per 100,000 population [6].

Data from Dharmais Cancer Hospital in 2018 revealed that breast cancer was the most prevalent type, accounting for 19.18% of all cancer cases, followed by cervical cancer (10.69%) and lung cancer (9.89%). Among women, breast and cervical cancers constituted the largest proportion of cancer diagnoses [7]. According to the 2016 Riau Province Health Profile, 325 cases of breast cancer were reported, with data from UPT Puskesmas Selatpanjang indicating approximately five cases requiring referrals [8].

In 2020, early detection efforts by the Ministry of Health identified 26,550 lumps, with 4,685 cases suspected to be breast cancer. Regions with the highest screening coverage included West Sulawesi, Bangka Belitung Islands (37.6%), and South Sumatra (32.1%). Conversely, Papua (0.6%), North Maluku (1.2%), and Southeast Sulawesi (1.7%) had notably low screening coverage [9]. In Riau Province, clinical breast cancer screening for women of reproductive age (SADANIS) covered only 13.4%, with Meranti Islands Regency reporting an even lower coverage of 1.6% [8].

Breast cancer screening aims to enable early detection, allowing treatment with techniques that minimize physical impact while maximizing recovery potential [10]. Early detection can be conducted by trained health workers at healthcare centers through clinical breast examinations (SADANIS), complemented by education on breast self-examination (SADARI). However, resource limitations often compel health workers to focus on motivating and educating women to perform SADARI correctly and consistently every month [11, 12].

The government has undertaken various efforts to address cancer prevention, including promotion, prevention, treatment, and rehabilitation programs.

Among these, health education plays a crucial role in improving women's understanding and attitudes toward their health. Putri *et al.* [13] demonstrated that health education significantly enhances knowledge, with mean scores increasing from 13.63 to 17.72. Similarly, according to Yulinda & Fitriyah [14], there are improvements in knowledge and attitudes following health education delivered through lectures and audiovisual media.

The Public Health Center (PHC) of Selatpanjang, located in the Meranti Islands Regency, faces challenges due to limited internet access. Most women of reproductive age (WUS) in this area have educational backgrounds equivalent to middle or high school, which impacts their ability to access information. Calendar-based media, as an innovative approach to health promotion, can serve as a reminder for scheduling SADARI by marking specific dates for their implementation.

According to data from the PHC of Selatpanjang, the coverage of clinical breast examinations has remained at 0% over the past two years. The lack of education and motivation regarding SADARI in the community is a significant challenge. Therefore, the researchers are interested in conducting this study in the working area of PHC of Selatpanjang, Meranti Islands Regency.

This study introduced an innovative approach by utilizing the SADARI Calendar (KALDARI) as a health promotion tool to improve the knowledge and attitudes of WUS in performing SADARI. Unlike conventional educational methods, which primarily rely on lectures and audiovisual media, the use of a printed calendar as an easily accessible tool that also functions as a daily reminder offers a practical and effective solution, particularly in areas with limited internet access, such as the Meranti Islands Regency. This approach has not been widely implemented in health promotion programs, making this study a valuable contribution to advancing public health education strategies. Accordingly, we aimed to evaluate the effectiveness of an innovative educational tool, the KALDARI, in improving the knowledge and attitudes of women of reproductive age regarding breast self-examination.

Materials and Methods

Study design

This study employed a quasi-experimental design with a one-group pre-test-post-test approach to evaluate the effectiveness of the KALDARI educational media in improving the knowledge and attitudes of WUS in performing breast self-examinations (SADARI).

Participants

The study was conducted from January to April 2024 in the working area of the PHC of Selatpanjang, Meranti Regency.

The study population comprised all WUS aged 30-50 years in the area, totaling 75 individuals.

A sample of 63 respondents was selected using purposive sampling based on inclusion criteria, namely WUS residing in the study area, capable of attending educational sessions, and willing to participate. Respondents who were postmenopausal or had reproductive health disorders were excluded. With a total population of 75 individuals and a margin of error set at 5%, the required sample size, calculated using the Slovin formula, was approximately 63 respondents after rounding.

Tools

Knowledge and attitudes about SADARI (breast self-examination) served as dependent parameters, while the KALDARI educational intervention served as the independent parameter.

The dependent parameters refer to the changes measured in the respondents, specifically their knowledge and attitudes toward SADARI techniques before and after receiving the educational intervention.

Knowledge about SADARI measured the extent to which respondents understand information regarding breast cancer, its signs and symptoms, and the importance of early detection using the SADARI method. This knowledge was assessed based on the respondent's answers to a questionnaire that evaluated their understanding of the breast self-examination procedure. Attitudes toward SADARI reflected how respondents perceived and were prepared to perform the SADARI technique in their daily lives. These attitudes included their beliefs, motivation, and views on the importance of breast self-examination as a form of breast cancer prevention. The attitudes can be either positive or negative, depending on the respondents' understanding and perception of the significance of this action.

The questionnaire used to measure the respondents' knowledge and attitudes consisted of 15 questions. Each question was scored, with the highest score being 15 (if all answers were correct) and the lowest score being one (if most answers were incorrect). The score represented the level of knowledge and attitude of the respondents toward SADARI. A higher score indicated better knowledge and attitude regarding the importance of breast self-examination, while a lower score reflected a less comprehensive understanding and attitude toward SADARI. The questionnaire was pre-tested, with an average validity score for each item above 0.6 and a Cronbach's alpha value greater than 0.7.

The KALDARI educational intervention was provided in the form of lectures and direct demonstrations of the SADARI technique.

The educational media used was the KALDARI calendar, which contained essential information about breast cancer and practical steps for performing SADARI. It is hoped that the KALDARI

education will enhance the respondents' knowledge and attitudes toward SADARI by providing clear information and direct skills in performing the examination.

Data collection

Data collection was carried out through interviews and observations using a validated and reliable questionnaire.

This questionnaire was used to assess the respondents' characteristics, knowledge level, and attitudes toward SADARI, both before (pre-test) and after (post-test) receiving the KALDARI education, which lasted approximately 45 minutes. The KALDARI media, in the form of a calendar, contained information and guidelines on breast cancer and the SADARI examination. The education session included a lecture and demonstration of the SADARI technique, covering topics, such as breast cancer, early detection, and the steps for self-examination.

Before completing the questionnaire, prospective respondents were provided with an informed consent form by the researcher.

During this process, the researcher ensured that the respondents understood the information provided and were allowed to ask questions or express any concerns they might have had.

Data analysis

The data were analyzed descriptively to describe the characteristics of the respondents and the changes in knowledge and attitudes before and after the intervention.

Inferential analysis using a paired t-test was conducted to evaluate significant differences between the pre-test and post-test results, with a 95% confidence interval. The analysis was performed using SPSS software to ensure accuracy and ease in processing the statistical data.

Findings

The study included 63 respondents, with the majority falling within the 30 to 35-year age range. Most participants were employed as daily laborers, followed by housewives and entrepreneurs. In terms of education, most respondents had completed high school, while a smaller group had completed junior high school. Regarding family characteristics, most respondents had two children, with the majority having between one and two children. Additionally, the majority of respondents had experienced normal deliveries, while a smaller group had undergone cesarean sections (Table 1).

In the pre-test, the mean knowledge score was 7.76 ± 2.85 , which increased to 9.88 ± 2.77 in the post-test ($p=0.0001$), indicating a highly statistically significant change. Similarly, the mean attitude score increased from 8.47 ± 2.31 in the pre-test to 11.28 ± 2.38 in the post-test ($p=0.0001$), further confirming the effectiveness of the intervention in improving respondents' knowledge and attitudes.

Table 1. Frequency of respondents' characteristics

Parameter	Category	Values
Age (year)	30-35	22(34.9)
	36-40	18(28.6)
	41-45	12(19.0)
	46-50	11(16.5)
Occupation	Civil servants/permanent employees	10(15.9)
	Self-employed	15(23.8)
	Daily labor	20(31.7)
	Housewife	18(28.6)
Education	Illiterate	4(6.3)
	Elementary	10(15.8)
	Junior school	15(23.8)
	High school	25(39.7)
	College	9(14.3)
Parity (child)	1	12(19.0)
	2	25(39.7)
	3	18(28.7)
	≥4	8(12.6)
Number of children	1-2	32(50.7)
	3-4	25(39.8)
	>4	6(9.5)
Delivery method	Vaginal	50(79.4)
	Cesarean	13(20.6)

Discussion

We aimed to evaluate the effectiveness of an innovative educational tool, the KALDARI, in improving the knowledge and attitudes of women of reproductive age regarding breast self-examination. There was a significant change in respondents' knowledge and attitudes after receiving the KALDARI education, demonstrating the effectiveness of the intervention. In terms of knowledge, a clear improvement is evident between the pre-test and post-test scores. Prior to the education, the respondents' average knowledge score was 7.76 ± 2.85 , reflecting a varied level of knowledge among the participants. However, after receiving KALDARI education, which included lectures and demonstrations of the SADARI technique, the average knowledge score increased to 9.88 ± 2.77 . This improvement suggests that respondents gained better and more comprehensive information about breast cancer and the importance of early detection through SADARI. The difference between the pre-test and post-test was highly statistically significant. This suggests that the KALDARI education had a strong influence on enhancing the respondents' knowledge. Furthermore, in terms of attitudes, a significant change was also observed following the education. The attitudes referred to relate to the respondents' understanding and readiness to perform breast self-examination (SADARI) as a step toward early breast cancer detection. The increase in scores reflects that respondents not only gained a better understanding of the importance of SADARI but also exhibited a positive change in their attitudes toward this action. This indicates that the KALDARI education successfully motivated respondents to be more proactive in conducting early breast cancer detection [15, 16].

Overall, both the knowledge and attitudes of the respondents showed significant improvement after

receiving the KALDARI education. This increase emphasizes that information-based education, coupled with practical demonstrations—as conducted through KALDARI—is highly effective in enhancing understanding and changing attitudes toward the importance of SADARI for early breast cancer detection. This education not only expanded knowledge but also fostered a more positive mindset and behavior toward preventing breast cancer. With this significant change, it can be concluded that the KALDARI education had a major impact on improving public knowledge and attitudes regarding the importance of early detection through SADARI.

This aligns with the findings of a study by Marfianti [17], revealing a statistically significant increase in the average pre-test score among 32 participants. These results suggest a substantial improvement in knowledge regarding breast cancer and early detection through the SADARI method, particularly among women in Dusun Semutan Jatimulyo Dlingo, following the educational activities, training, and practical SADARI exercises. Additional research also supports these findings, demonstrating a significant impact of health education on both knowledge and attitudes toward breast self-examination (SADARI) among WUS [18].

The use of calendars as a medium for delivering health information presents a promising alternative, particularly in enhancing knowledge retention and engagement among target groups such as housewives [19, 20]. A calendar serves as a systematic tool for organizing and calculating time, assigning names to specific time periods, such as days, which are then recognized as calendar dates [21, 22]. The KALDARI, or self-examination calendar, is a specialized tool designed to promote awareness, provide information, and offer education on breast cancer detection through a user-friendly format. It functions similarly to a flipchart, allowing for the easy dissemination of educational material that includes images, a schedule for performing SADARI, and simple instructions that are easily understood by users [23].

This educational medium is particularly effective for WUS, who respond positively to the visually appealing features of the KALDARI, including its vibrant colors and images. These elements increase attention and foster a higher level of engagement compared to other methods. Moreover, the KALDARI's interactive nature makes it a practical tool for health education in remote areas with limited access to electricity, as it does not require power and is portable [24, 25].

Although the majority of respondents demonstrated positive changes in their knowledge and attitudes after receiving KALDARI education, some respondents did not experience significant changes in either their knowledge or attitudes following the intervention. Several factors may explain this outcome.

First, some respondents may have already possessed a good level of knowledge regarding breast cancer and the SADARI self-examination method before participating in the education. They may have had a deep understanding of the topic, either from personal experience, prior information, or other sources of education [26]. Therefore, although they received additional information during the KALDARI education, it did not lead to a significant change in their knowledge, as they already had sufficient or even more advanced knowledge compared to many other respondents.

Second, regarding attitudes, some respondents may not have been influenced by the educational content. For certain individuals, even though they received clearer information about the importance of early detection through SADARI, factors, such as discomfort or fear of performing self-examinations might have prevented them from changing their attitudes [27]. Additionally, it is possible that some respondents did not perceive the same urgency regarding early breast cancer detection, possibly due to factors such as age, health status, or previous experiences that made them feel less at risk. This could explain why their attitudes remained unchanged despite the education [28].

Another factor that may have contributed is the variation in how respondents absorb and process information. Each individual has a unique learning style, and while the educational material was presented clearly and systematically, some respondents may have struggled to understand or retain the information provided. This could have affected changes in their knowledge and attitudes following the educational intervention.

This study did not include a control group that did not receive the KALDARI intervention, which makes it challenging to determine whether changes in participants' knowledge and attitudes were solely attributable to the intervention. Without a comparison group, external factors, such as exposure to information from other sources or discussions with fellow participants, may have also influenced the study results. Furthermore, this research focused solely on increasing knowledge and attitudes without assessing whether these changes were actually translated into real-life actions. A positive attitude toward SADARI does not necessarily result in a consistent habit of performing breast self-examinations. Therefore, future research that evaluates the impact of KALDARI on actual behavior and includes a control group would provide more robust evidence of the intervention's effectiveness.

Conclusion

The KALDARI educational intervention is effective in improving respondents' knowledge and attitudes regarding the importance of early breast cancer detection through self-examination (SADARI).

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Ethical Permissions: Participants' privacy is protected, there was no incentive to participate in the study, and registered prospective respondents signed an informed consent form. The researcher obtained ethical permission before beginning data collection. This study was authorized by the Health Polytechnic of the Ministry of Health in Riau, under approval number: LB.02.06/2/305/2024.

Conflicts of Interests: The authors declared no conflicts of interests.

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