



The Effect of Health Education on Treatment Compliance in Breast Cancer Patients



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Authors

Hariato S.^{*1} MSc
Nursalam N.² MD
Maryam D.³ MSc

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¹Faculty of Vocational Studies, Airlangga University, Surabaya, Indonesia

²Faculty of Nursing, Airlangga University, Surabaya, Indonesia

³Department Dr. Soetomo Regional Hospital, Surabaya, Indonesia

*Correspondence

Address: Nursing Doctoral Program, Faculty of Nursing, Airlangga University, Dr. Street Ir. H. Soekarno, Mulyorejo, District, Mulyorejo, SBY City, East Java, Surabaya, Indonesia. Postal Code: 60115
Phone: +62 (812) 30948438
Fax: +62 (851) 59670708
susilo.hariato@vokasi.unair.ac.id

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ABSTRACT

Aims This study aims to determine the effectiveness of health education in increasing treatment compliance in breast cancer patients.

Materials & Methods This quantitative research employed a cross-sectional method in all breast cancer patients undergoing treatment from May to June 2024 at a hospital in Surabaya. This study used the total sampling technique, with data collected through questionnaires evaluating the level of patient understanding of health education, treatment compliance, and perceptions of the compliance importance.

Findings Health education significantly increased patients' adherence to treatment. There was a strong relationship between adherence, compliance and therapy success. Good health education increased patients motivation, improved therapy outcomes and prolonged patients resilience in long-term treatment.

Conclusion Compliance, adherence and persistence have a significant impact on the success of therapy.

Keywords Health Education; Compliance; Treatment; Breast Cancer

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[1] Health education actions on male breast cancer: A protocol for ... [2] Effect of health education on female teachers' knowledge ... [3] Impact of health education intervention on breast cancer awareness ... [4] Effects of Tai Chi App and Facebook health education programs on breast ... [5] Effect of health education regarding awareness examination ... [6] Application of thematic health education on breast cancer patients ... [7] The effect of peer education on health beliefs about breast ... [8] A quasi-experimental study of the effect education has on the knowledge ... [9] The role of space in obstructing clinical sexual health ... [10] Effect of health education on the uptake of breast cancer screening among ... [11] A study on effect health education intervention program about ... [12] Effect of the health belief model-based education on preventive ... [13] Evaluating the effect effects of education intervention ... [14] Impacts of self-care education on adverse events and mental health-related ... [15] The effect of education given to syrian refugee women in their language ... [16] The effect of a health education program on breast and cervical cancer prevention ... [17] Health education on breast cancer and early detection ... [18] Effect of breast cancer education based on the health belief model ... [19] Application of research results on adolescent reproductive health ... [20] Health education on early detection of breast cancer through ... [21] Impact of health education on preventive practices of breast cancer among ... [22] Effectiveness of health education Breast Self Examination (BSE) ... [23] The significance of PICC nursing health education ... [24] Evaluate the effectiveness of awareness program with health education on breast cancer and skill ... [25] The effect of health education about check breast self (SADARI) on adolescent ... [26] Implementation of health education counseling on breast self examination (BSE) with ... [27] The effectiveness of mobile-based self-care education and counselling on general health and quality of life ... [28] Effect of education on perceived susceptibility of breast cancer preventive ... [29] Assessing knowledge, competence, and performance following web-based ... [30] Correction to: The effect of health education given to syrian ... [31] The impact of systematic health education on breast cancer ... [32] Influence of the health education system on knowledge rate ... [33] The influence of health education using audio visual media on ... [34] The influence of health education based on MCAT mode ... [35] The influence of health education about awareness using the ... [36] The effectivity of structured health education about non-pharmacological ... [37] The influence of health education using peer education ... [38] Investigation on the postoperative sexual ...

Introduction

Health education has become a key element in the management of chronic diseases, including breast cancer [1]. Breast cancer, as one of the most common forms of cancer worldwide, is not only physically but also psychologically burdensome for patients [2]. When a patient is diagnosed with breast cancer, they often face a long and complicated journey involving multiple medical interventions such as surgery, chemotherapy, radiation, and hormone therapy [3]. Adherence to prescribed treatments is critical to ensure optimal outcomes [4]. However, a major challenge in breast cancer management is patient adherence to treatment regimens that often require long-term commitment [5].

Health education is an important tool in facilitating patient understanding of their disease, their treatment, and the importance of adherence to the treatment regimen [6]. Through effective health education, patients can be provided with relevant information about their condition, potential side effects of treatment, and strategies to manage these side effects [7]. This increases patient knowledge and can influence their attitudes and behaviors toward treatments [8]. This increased knowledge and understanding is expected to increase patient motivation to adhere to treatment, ultimately improving health outcomes [9].

Treatment adherence is one of the main determinants of the success of breast cancer therapy [10]. Patients compliant with their treatment tend to have better clinical outcomes than non-compliant patients [11]. However, the level of treatment adherence in breast cancer patients often varies and is influenced by various factors such as the level of knowledge about the disease, beliefs about treatment, social support, and perceptions about quality of life [12]. Therefore, well-designed health education tailored to the patient's individual needs can play an important role in improving treatment adherence [13]. In addition, health education also plays a role in building a strong relationship between patients and healthcare providers [14].

This relationship can increase patient trust in healthcare providers, improving their treatment adherence [15]. When patients feel supported and understood by their medical team, they are more likely to adhere to treatment recommendations and undergo necessary therapy despite significant challenges [16]. One of the main challenges in measuring the effectiveness of health education is the complexity and multifactorial nature of the treatment adherence process. Not all patients respond to health education similarly [17]. Age, education level, cultural background, and socioeconomic status can influence how patients receive and process health information. Therefore, a personalized and individualized approach to health education is becoming increasingly important. This approach involves

assessing the patient's educational needs and providing educational interventions tailored to those needs [18].

In the context of breast cancer, health education interventions often include a variety of methods such as individual counseling, group education, use of print and electronic media, and self-management skills training [19]. Each method has advantages and limitations, and its effectiveness may depend on how it is implemented in a specific context [20]. Therefore, further research is needed to evaluate which educational methods are most effective in improving treatment adherence in breast cancer patients [21]. Furthermore, it is important to recognize that health education is not limited to the transfer of information [22]. It also involves empowering patients to take an active role in managing their disease. This empowerment can be achieved through interventions that encourage shared decision-making between patients and healthcare providers, as well as through emotional support that helps patients cope with the stress and anxiety associated with cancer diagnosis and treatment [23]. Thus, health education can be considered an integral component of holistic care that aims to improve treatment adherence and the patient's overall quality of life [24]. The quality of life of breast cancer patients is an important aspect that must be considered in health education. Although the primary goal of treatment is to control or cure the disease, it is also important to consider how treatment affects the patient's physical, emotional, and social well-being [25]. Effective health education should include information on maintaining or improving quality of life during and after treatment. This may include management of side effects, strategies for maintaining mental health, and support for maintaining social and professional activities [26]. Health education should also focus on preventing disease recurrence. For many breast cancer patients, the threat of disease recurrence is a source of constant worry [27]. Through health education, patients can be informed about the signs of recurrence to look out for and preventive measures they can take [28]. This includes maintaining a healthy lifestyle, including a balanced diet, regular exercise, and avoiding certain risk factors. By providing this knowledge, patients can feel more in control of their health and better prepared for the future [29].

Finally, it is important to consider the role of family and caregivers in supporting treatment adherence in breast cancer patients [30]. Health education involving family and caregivers can improve treatment outcomes, as they often play a critical role in helping patients navigate their daily treatment [31]. By educating family and caregivers, they can be better prepared to provide the support needed, both in practical aspects, such as medication management, and in emotional aspects, such as encouragement and

motivation [32]. Overall, measuring the effectiveness of health education in improving treatment adherence in breast cancer patients is an important step in improving health outcomes and patient quality of life [33]. Through a holistic, personalized, and ongoing approach, health education can significantly impact how breast cancer patients experience their treatment and how they respond to challenges faced throughout the treatment journey [34]. Further research and ongoing evaluation are needed to develop and optimize health education interventions for changing patient needs and technological developments [35].

The main objective of this study was to measure the effectiveness of health education in improving treatment adherence in breast cancer patients. The urgency of this study lies in the increasing incidence of breast cancer globally and the challenges faced in achieving optimal treatment adherence among patients. Poor adherence to treatment not only negatively impacts patient clinical outcomes but also increases the burden of health costs. Therefore, there is an urgent need to see the effectiveness of more targeted health education. Utilizing a personalized approach and digital technology, this study is expected to provide an intervention model that aligns with patient needs and can provide better outcomes. This urgency is also driven by the need to improve the quality of life of breast cancer patients, which is often neglected in treatment efforts that only focus on disease control. Meanwhile, the novelty of this study lies in the individual approach to health education, which is tailored to the characteristics and specific needs of each breast cancer patient.

Materials and Methods

This was a quantitative study carried out using the experimental quasi-pre-test and post-test methodology from May to June 2024 at a hospital in Surabaya. This time was chosen to ensure that the data collected covered all aspects of health education and treatment compliance of patients undergoing breast cancer treatment.

Statistical population included all patients with breast cancer undergoing treatments. The samples were selected using a purposive sampling technique by selecting participants based on specific inclusion and exclusion criteria. There were around 142 breast cancer patients meeting all the requirements and actively received breast cancer treatment at the hospital. 18 out of 142 were selected to carry out a pilot study.

The research sample was taken using the total sampling technique. This technique was chosen to ensure that all population variations can be represented in the research and that the results can be generalized. In this context, all breast cancer patients undergoing treatment during the study period who undergone health education were

included in the study. In contrast, exclusion criteria included patients who were unwilling to participate or had conditions that prevent full participation in the study. Thus, this research sample consisted of all breast cancer patients who met the criteria during the study period.

The data collection tool in this study was questionnaire to assess breast cancer patients. This questionnaire included parameters such as the level of the patients' understanding of health information, patients' perception of the importance of treatment compliance and compliance with treatment protocols recommended by health professionals. The validity and reliability of the questionnaire were confirmed with values greater than 0.7 with a Cronbach alpha of 0.86. This study aimed to integrate primary data to provide a comprehensive picture of how health education can influence treatment adherence in breast cancer patients.

The preparation was carried out using the Zung Self-Rating Anxiety Scale (SAS/SRAS) to assess the level of anxiety. The Zung Self-Assessment Anxiety Scale is an assessment of distress in breast cancer patients developed based on health education in the Diagnostic and Statistical Manual of Mental Disorders (DSM-II) [20]. Data analysis was done using univariate and bivariate tests. Wilcoxon, Mann-Whitney, and Chi-square tests with a confidence level of $p < 0.05$ in SPSS 21.

The data collection tool in this study was a questionnaire to assess breast cancer patients. This questionnaire, with three questions, covers parameters such as patient's level of understanding of health information, patient's perception of the importance of medication adherence; and finally, compliance with treatment protocols recommended by health professionals. This study aims to integrate primary data to provide a comprehensive picture of how health education can influence treatment adherence in breast cancer patients.

The preparation was carried out using the Statistical Analysis System (SAS/STAT) to assess anxiety levels. The Statistical Analysis System was an assessment of distress in breast cancer patients that was developed based on health education in the Diagnostic and Statistical Manual of Mental Disorders (DSM-II).

Findings

The characteristics of the respondents in this study, including age were collected through a questionnaire specifically designed to measure medication adherence and their level of understanding of the health education they received. Based on age data, most respondents were aged 26-35. The youngest respondents were between 17 and 25 accounting for 11.11% (Table 1).

The construct of the influence of health education effectiveness to improve treatment compliance in breast cancer patients showed a Cronbach's Alpha

value of 0.513, below the threshold of 0.7, indicating that its reliability still needs improvement. Although the Composite Reliability for this construct reached a perfect value of 1,000, indicating very high internal consistency, the AVE value of 1,000 indicates that this construct perfectly explains all the variability of its items. As with persistence, this excessively high value may indicate measurement error or the need to revisit this construct.

Table 1. Respondent characteristics

Age (year)	Frequency (%)
17-25	2 (11.11)
26-35	7 (38.89)
36-45	6 (33.33)
>45	3 (16.67)

The regression analysis results showed that the construct of the effect of health education effectiveness to increase treatment compliance in breast cancer patients had a R-squared value of 0.478. This means that about 47.8% of the variability in treatment compliance in breast cancer patients can be explained by the effectiveness of the health education provided. The adjusted R-squared value of 0.453 is slightly lower than the original. This adjustment was made to consider the number of predictors in the model and provide a more accurate estimate of how well the model fits the wider population. With this value, after adjusting for model complexity, the effectiveness of health education explained about 45.3% of the variability in treatment compliance. Although almost half of the variation in compliance was explained by health education, other factors outside the model also affected treatment compliance, which were not captured in this analysis. The bootstrapping method in SEMpls was used to determine the validity and reliability of the research

data between independent and dependent parameters (Figure 1). This test used t-statistics and p-values, which are presented as a t table, to determine valid research data for the t-statistic value, namely >1.96, and p-values, namely <0.05.

Based on the analysis results on the compliance parameter, the original sample value was recorded at 0.199, while the sample mean (M) showed a value of 0.183±0.074 and the obtained t-statistics value was 2.712. Thus, the p-value for this parameter was 0.007, indicating that this result is statistically significant. These results indicated that the compliance parameter significantly influenced the analyzed model.

In the adherence parameter, the original sample value was recorded at 0.263, while the sample mean showed a slightly higher value of 0.281±0.085. The t-statistics value obtained was 3.091, indicating that this parameter's influence was significant. In addition, the p-value of 0.002 indicates that this result was statistically significant because it was smaller than the significance limit of 0.05, indicating that adherence significantly influences the analyzed model.

In the persistence parameter, the analysis results showed that the original sample had a value of 0.503, while the sample mean was slightly lower, which was 0.470±0.180. The resulting t-statistics value was 2.795, which indicated the significance level of this parameter's influence. The p-value of 0.005 was smaller than 0.05, meaning this result was statistically significant. This indicated that persistence strongly and significantly influences the analyzed model. The limitation of this study is that it only examines the effectiveness of health education in increasing treatment adherence in breast cancer patients.

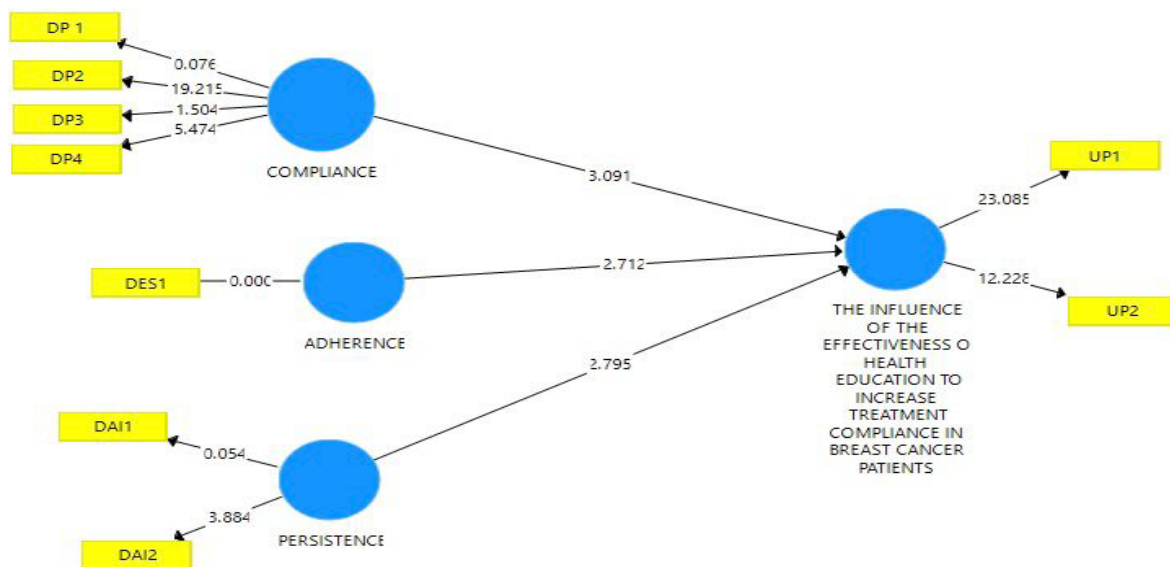


Figure 1. Bootstrapping output

Discussion

Discussion of the compliance parameter in the context of the influence of the effectiveness of health education on treatment compliance in breast cancer patients showed significant results [36]. This analysis showed a statistically significant relationship between health education and treatment compliance. The compliance parameter in this study represented the level of patient compliance with treatment recommended by medical personnel. Health education provided to breast cancer patients aims to improve their understanding of the importance of undergoing treatment properly, including the right time, dosage, and how to take medication [37]. The effectiveness of health education can help patients realize the risks and benefits of each stage of treatment, which ultimately increases their motivation and commitment to comply with the prescribed treatment. The results of this analysis indicated that the better the health education patients receive, the higher their compliance with treatment [38]. In the context of breast cancer, high compliance is very important to improve the quality of life of patients and optimize treatment outcomes. Thus, interventions in the form of health education are one of the key components in the strategy for treating breast cancer patients. This study proved that the effectiveness of health education significantly influences the level of treatment compliance, which contributes to the success of therapy and reduces the rate of disease recurrence. Therefore, providing comprehensive and ongoing health education to breast cancer patients needs to be prioritized in the health care system. This education helps improve compliance and empowers patients to take an active role in their health management.

Discussion of adherence parameters showed significant results in the context of the study. Adherence in this study referred to the level of patient consistency in following the treatment recommended by medical personnel, both in terms of timeliness, frequency, and dosage [12]. The adherence parameter significantly influenced the analyzed model based on the analysis results. The results showed that the relationship between adherence and treatment success was very close. Effective health education can have a positive impact on the level of patient compliance in following treatment. A deeper understanding of the importance of complying with treatment instructions can encourage patients to be more consistent in undergoing treatment, ultimately improving therapy results and reducing the risk of complications or disease recurrence [13]. These results emphasized the importance of intervention efforts that focus on increasing adherence, especially in the treatment of chronic diseases such as breast cancer, where the sustainability and consistency of treatment greatly affect long-term outcomes.

Through comprehensive education, patients could better understand the direct impact of adherence to treatment and how it contributes to quality of life and therapy success. These findings support the hypothesis that adherence plays an important role in determining the effectiveness of treatment and underscore the need to provide ongoing health education to improve patient compliance with prescribed treatment regimens.

The discussion of the persistence parameter showed that this parameter significantly influences the analyzed model. Persistence in this context referred to the patient's persistence in undergoing treatment, especially when facing challenges that may arise during the long-term care process. The analysis results showed that persistence has a strong relationship with treatment outcomes, meaning that patients with long-term adherence experience better treatment outcomes [33]. In the treatment of chronic diseases such as breast cancer, persistence is very important. Patients are often faced with various difficulties, such as side effects of treatment, emotional stress, and long-term commitment to the treatment regimen [29]. Therefore, high persistence leads patients to pursue treatment despite these challenges. The statistical significance of these results emphasizes the importance of supporting patients in remaining persistent in undergoing treatment. Interventions such as patient support programs, ongoing health education, and family and medical personnel involvement can be important supporting factors to increase patient persistence. With this support, patients will be more motivated to maintain treatment adherence, which will increase therapy's success. These findings confirm that persistence is a key factor in long-term treatment success. Interventions aimed at improving persistence, such as ongoing counseling and close monitoring, can play an important role in improving patient quality of life and overall treatment outcomes.

Effective health education is vital in increasing patient understanding of the importance of following treatment consistently and increasing adherence rates. Therefore, breast cancer patient care strategies should include comprehensive health education, ongoing support, and active involvement of family and medical personnel to improve adherence, adherence, and persistence. Interventions targeting improvements in these three parameters will enhance patient quality of life and overall treatment outcomes, supporting the hypothesis that effective health education significantly contributes to treatment adherence and the success of breast cancer therapy.

Conclusion

Compliance, adherence, and persistence have a significant impact on therapy success.

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Ethical Permissions: This research received ethical approval from the Research Ethics Committee of RSUD Dr Soetomo Surabaya: 0721/KEPK/VII/2023 dated 18 July 2023. In addition, respondents also signed an informed consent form.

Conflicts of Interests: All authors expressly declare that no conflicts of interest affect the objectivity or results of this research. This confirms that the research was conducted with complete integrity and independence, without any influence from any party that could influence the results or interpretation of the data. Openness and transparency regarding the absence of conflicts of interest are essential in ensuring the validity and reliability of the presented research results. Thus, readers can trust and rely on the information presented in this publication as an objective representation of research findings.

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