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## CLINICAL TRIAL STUDY

# Unraveling the Link between Self-efficacy and self-management in Breast Cancer Patients during the COVID-19 Pandemic: A Cross-sectional Study

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### Abstract:

#### Background:

The COVID-19 pandemic necessitates that cancer patients take on a more active role in self-managing their illness and adjusting to the altered healthcare resources. To perform self-management behaviors, patients may need an adequate level of self-efficacy. However, little is known about breast cancer patients' self-efficacy and self-management in pandemic times.

#### Aim:

This study aimed to assess the self-efficacy and self-management of breast cancer patients undergoing therapy during the COVID-19 pandemic and identify their associations.

#### Methods:

A descriptive-analytical, cross-sectional design was used. One hundred and eight breast cancer patients undergoing treatment were recruited from the National Cancer Center in Indonesia. Participants completed questionnaires that consisted of the Cancer Behavior Inventory, the Depression Anxiety Stress Scale, the Enrichd Social Support Instrument, and the Self-Management Assessment Scale. Data were analyzed using multiple regression.

#### Results:

The study found that 45.4% and 42.6% of breast cancer patients under treatment had a low level of self-efficacy and self-management, respectively. Self-efficacy is positively associated with self-management in breast cancer patients ( $p=0.001$ ) after controlling for various factors, including cancer stage, psychological factors, and social support. The factor most related to self-management is self-efficacy, as measured by the odds ratio (OR), which was 16.713 (95% CI: 4.424-63.137), while the ORs of social support and stage were 4.968 (95% CI: 1.785-13.831) and 0.190 (95% CI: 0.044-0.820), respectively.

#### Conclusion:

It can be concluded that self-efficacy is strongly and positively associated with self-management in breast cancer patients undergoing treatment. Therefore, nursing interventions focusing on enhancing patients' self-efficacy are needed.

**Keywords:** Breast cancer, Self-efficacy, Self-management, Social support, COVID-19 pandemic, Cancer care.

### Article History

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## 1. INTRODUCTION

The World Health Organization (WHO) has declared the coronavirus disease 2019 (COVID-19) pandemic to be over on May 5, 2023 [1]. While the pandemic may have officially come

to an end, it is crucial to reflect on the lessons learned during this challenging period. The lessons learned can help us better prepare for and mitigate the effects of future health crises and strengthen the approaches to safeguarding public health.

During the COVID-19 pandemic, healthcare services for noncommunicable diseases have been significantly impacted [2]. The entire continuum of cancer care, *i.e.* screening, diagnoses, treatment, and palliative care, has also been severely

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disrupted in the pandemic [3]. The impacts were particularly devastating in low- and middle-income countries (LMICs), including Indonesia [4, 5].

Maintaining cancer care while mobilizing healthcare resources to manage COVID-19 presented significant hurdles for the LMICs [5]. In normal times, most LMICs have considerable obstacles in terms of the availability, accessibility, and affordability of cancer care services [5]. The majority of healthcare systems experience severe disruption of routine services as they struggle to handle the growing influx of patients with COVID-19 [5]. Patients' access to the hospital was limited due to strictly enforced confinement rules or mandatory lockdowns. In addition, cancer treatments were delayed or postponed to minimize the risk of cancer patient exposure to COVID-19 [4 - 6].

The COVID-19 pandemic has also severely affected breast cancer patients [7]. Breast cancer is the most prevalent cancer among women globally as well as in Indonesia, accounting for 11.7% and 19.2% of all cancers, respectively [8, 9]. According to Chinese and Italian studies, 8.3% to 29% of breast cancer patients were infected by COVID-19 [10, 11]. An international registry also reported that, among the cancer patient population, COVID-19 cases mostly occurred in breast cancer patients (21%) [12]. Thus, breast cancer is a particularly significant public health concern during the pandemic.

The management of breast cancer patients has been reorganized by the health care services in the COVID-19 pandemic [7, 13]. Nonurgent surgeries and radiotherapy were delayed, chemotherapy and immunotherapy schedules were spread out, and oral therapies replaced intravenous treatment [13, 14]. According to a patient report, the most frequent delays were in routine or follow-up clinic consultations, diagnostic imaging, and lab testing procedures [15]. Apart from the service delays and changes, breast cancer patients also experienced heightened anxiety, psychological distress, and a sense of isolation along with decreased social support during the pandemic [16].

To cope with those challenges, self-efficacy, and self-management became particularly crucial for breast cancer patients during the pandemic. The pandemic necessitates that cancer patients take on a more active role in self-managing their symptoms and adjusting to the altered healthcare resources, underscoring the critical role that self-efficacy plays in this process [17]. Self-efficacy refers to one's confidence in his/her own ability to carry out a particular behavior [18]. Self-efficacy influences how patients manage their illness and overcome obstacles caused by the disease [19]. It also facilitates the adoption and maintenance of healthy behaviors [19]. Studies also found that self-efficacy predicts self-management [20, 21].

Despite their essential roles, information regarding the self-efficacy and self-management of breast cancer patients during the COVID-19 pandemic is very limited. Therefore, this study aimed to assess: 1) self-efficacy of the breast cancer patients undergoing therapy during the COVID-19 pandemic; 2) self-management of the breast cancer patients undergoing therapy during the COVID-19 pandemic; 3) factors associated with

self-management of the breast cancer patients undergoing therapy during the COVID-19 pandemic.

## 2. MATERIALS AND METHODS

### 2.1. Study Design

This study used a descriptive-analytical, cross-sectional design.

### 2.2. Sample and Procedure

Participants were recruited using a convenience sampling technique at the Dharmais National Cancer Center, Jakarta, Indonesia. The inclusion criteria were: 1) female patients diagnosed with breast cancer; 2) were undergoing active cancer treatment; 3) aged  $\geq 18$  years; 4) were willing to participate and signed the informed consent. Patients with altered levels of consciousness were excluded from the study.

Lemeshow's formula [22] was utilized to determine the sample size of 96 participants. Accounting for a potential dropout rate of 10%, 106 participants were required for this study.

Following ethical approval, we recruited the potential participants at the outpatient and inpatient units of the Dharmais National Cancer Center. After providing a thorough explanation of the study, written informed consent was obtained from each participant. The participants filled out the questionnaires electronically using a Google form.

### 2.3. Instruments

Data were collected using a structured questionnaire consisting of four parts. The first part assessed the demographic and clinical characteristics of the participants. The second part measured self-efficacy using the Cancer Behavior Inventory (CBI) version 2.0 [23]. CBI comprises 33 questions encompassing seven factors, *i.e.* 1) maintenance of activity and independence; 2) seeking and understanding medical information; 3) stress management; 4) coping with treatment-related side-effects; 5) maintaining a positive attitude about cancer; 6) affective regulation; and 7) seeking support [23]. The self-efficacy level is categorized into high (score  $\leq 86$ ) and low (score  $> 86$ ) on a scale of 27-108. CBI has demonstrated its validity and reliability (Cronbach's alpha of the original CBI = 0.94) in various studies done in several countries, including Indonesia [23 - 25].

The third part of the questionnaire was the Depression and Anxiety Stress Scale (DASS) questionnaire to examine psychological factors that might influence self-management [26]. A total score  $< 25$  indicates no significant anxiety and depression, while a total score of  $\geq 25$  indicates anxiety and depression. This 14-item questionnaire is a valid and reliable instrument that has been widely used in many languages and populations [27 - 29].

The fourth part assessed the social support received by the participants using Enrichd Social Support Instrument (ESSI) [30]. It consists of seven items measuring emotional, instrumental, and informational dimensions of support [30]. Participants with a total score  $> 28$  are categorized as having

adequate social support. ESSI has also been validated in several studies [30, 31].

Finally, the patients' self-management was measured using the Self-Management Assessment Scale (SMASc) which was originally developed for patients with type II diabetes mellitus [32]. Ten-item SMACs measure five essential domains of self-management, *i.e.*: knowledge, goals for the future, daily routines, emotional adjustment, and social support [32]. SMACs score of > 32 indicates good self-management, on a scale of 10-40. The Cronbach's alpha for the original SMACs was 0.925 [32]. For the purpose of this study, we adapted SMACs for breast cancer patients. A psychometric evaluation conducted on 108 patients demonstrated its validity and reliability, with a Cronbach's alpha value of 0.885.

#### 2.4. Data Analysis

Data were analyzed using SPSS Statistics 25.0. Descriptive statistics were calculated for sociodemographic and clinical characteristics, self-efficacy, psychological factors, social support, and self-management. The relationships of patient characteristics, self-efficacy, psychological factors, and social support with self-management were assessed using Pearson Chi-square tests. Moreover, to identify the strongest factor that influences self-management among the independent factors (patient characteristics and self-efficacy) and confounding factors (psychological factors and social support), we conducted multiple logistic regression analysis. A significance level of 0.05 was considered to be statistically significant.

### 3. RESULTS

#### 3.1. Participant Characteristics

Data were collected from a total of 108 participants recruited in June-July 2022. The majority of the participants were recruited at the outpatient unit (78.7%), were in the age range of 46-55 years (43.5%), were married (78.7%), graduated from senior high school (45.4%), worked as housewives (62.0%), and had a family income more than the minimum wage in Jakarta province (> IDR 4,642,854 or roughly USD 309). Most participants had their husbands as primary caregivers (47.2%), and used public transportation to travel to the hospital (62.0%). Other predominant sociodemographic characteristics were that 86.1% of the participants were Muslims and 43.5% were of Javanese ethnicity.

Over eighty percent of the participants (81.5%) were diagnosed with stage IIB-IV breast cancer (81.5%). Slightly more than half of participants were diagnosed less than a year ago (53.7%) and had 1-2 physical symptoms (59.3%). Most participants experienced pain (66.7%) and had metastasis (74.1%). All participants had insurance to finance their health care services.

Our assessment indicated that slightly more than half of the participants had a high level of self-efficacy (54.6%), adequate social support (57.4%), and good self-management (57.4%). However, 50.9% of the participants reported that they had anxiety or depression. The details of all participant characteristics are presented in Table 1.

**Table 1. Participant characteristics and levels of self-efficacy, social support, anxiety or depression, and self-management (n = 108).**

Variable	N (%)
<b>Sociodemographic</b>	-
<b>Ward/unit</b>	
- Outpatient	85 (78.7)
- Inpatient	23 (21.3)
<b>Age</b>	
- 26-35 years old (early adult)	4 (3.7)
- 36-45 years old (late adult)	33 (30.6)
- 46-55 years old (early elderly)	47 (43.5)
- 56-65 years old (late elderly)	15 (13.9)
- > 65 years old (elderly)	9 (8.3)
<b>Marital Status</b>	
- Married	85 (78.7)
- Divorce/Not Married	23 (21.3)
<b>Education</b>	
- Elementary School	8 (7.4)
- Junior High School	13 (12.0)
- Senior High School	49 (45.4)
- Bachelor/Master/Doctoral Degree	38 (35.2)
<b>Occupation</b>	
- Government Employee/Army	11 (10.2)
- Private Employee/Entrepreneur	30 (27.8)
- Housewife/Not Working	67 (62.0)
<b>Salary</b>	
- > Minimum Wage (IDR 4,641,854)	58 (53.7)
- < Minimum Wage	50 (46.3)

(Table 1) contd....

Variable	N (%)
<b>Sociodemographic</b>	-
<b>Caregiver</b>	
- Own Self	20 (18.5)
- Husband	51 (47.2)
- Child	24 (22.2)
- Other	13 (12.0)
<b>Transportation to the hospital</b>	
- Public Transportation	67 (62.0)
- Private Vehicle	41 (38.0)
<b>Religion</b>	
- Islam	93 (86.1)
- Christianity (Protestant)	10 (9.3)
- Catholic	2 (1.9)
- Buddha	3 (2.8)
<b>Ethnicity</b>	
- Javanese	47 (43.5)
- Batakese	6 (5.6)
- Sundanese	25 (23.1)
- Betawinese	11 (10.2)
- Mixed/Other	19 (17.6)
<b>Clinical</b>	
<b>Cancer stage</b>	
- Early (0-IIA)	20 (18,5)
- Advanced (IIB-IV)	88 (81,5)
<b>Time since diagnosis</b>	
- < 1 year	58 (53,7)
- ≥ 1 year	50 (46,3)
<b>Type of therapy</b>	
- Surgery	20 (18,5)
- Chemotherapy	33 (30,6)
- Radiotherapy	5 (4,6)
- Combination	46 (42,4)
- Other	4 (3,7)
<b>Physical symptom</b>	
- None	8 (7,4)
- 1-2 physical symptoms	64 (59,3)
- > 2 physical symptoms	36 (33,3)
<b>Pain</b>	
- None	36 (33,3)
- Experiencing pain	72 (66,7)
<b>Metastasis</b>	
- Yes	28 (25,9)
- No	80 (74,1)
<b>Cancer wound</b>	
- None	84 (77,8)
- Had cancer wound	24 (22,2)
<b>Financial support</b>	
- National health insurance/private insurance	108 (100)
- No insurance	
<b>Other variables</b>	
<b>Self-Efficacy</b>	
- Low	49 (45,4)
- High	59 (54,6)
<b>Anxiety or depression</b>	
- Yes	55 (50,9)
- No	53 (49,1)
<b>Social Support</b>	
- Inadequate	46 (42,6)
- Adequate	62 (57,4)
<b>Self-Management</b>	
- Poor	46 (42,6)
- Good	62 (57,4)

Furthermore, the bivariate analyses yielded significant relationships between 1) stage of cancer, 2) pain, 3) self-efficacy, 4) social support, 5) anxiety or depression, and self-management with p values of 0.044, 0.023, 0.000, 0.000, and 0.048, respectively (Table 2).

Finally, multiple logistic regression was performed to identify the factors influencing the self-management of breast cancer patients (Table 3). Self-efficacy was found to be the

strongest factor influencing self-management (OR = 16.713; 95% CI: 4.424-63.137). This means that the odds of breast cancer patients with good self-efficacy performing better self-management were 16.713 times higher compared to those with poor self-efficacy, after controlling for stage, social support, and anxiety/depression factors. Other factors significantly associated with self-management were the cancer stage (OR = 0.190; 95% CI: 0.044-0.820) and social support (OR = 4.968; 95% CI: 1.785-13.831).

**Table 2. Relationships of participant characteristics, self-efficacy, psychological factors, and social support with self-management.**

Variable	Self-management				Total		OR (95% CI)	P-value
	Poor		Good		n	%		
	n	%	N	%				
<b>Unit/Ward</b> - Outpatient - Inpatient	36 10	42.4 43.5	49 13	57.6 56.5	85 23	100 100	0.955 (0.377-2.421)	1.000
<b>Transportation to the hospital</b> - Public - Private	29 17	43.3 41.5	38 24	56.7 58.5	67 41	100 100	1.077 (0.490-2.367)	1.000
<b>Salary</b> - > Min. Wage - < Min. Wage	24 22	42.4 44.0	34 28	58.6 56.0	58 50	100 100	0.898 (0.418-1.930)	0.937
<b>Marital Status</b> - Married - Single/Divorce	37 9	43.5 39.1	48 14	56.5 60.9	85 23	100 100	1.199 (0.468-3.072)	0.888
<b>Cancer stage</b> - Early - Advanced	4 42	20.0 47.7	16 46	80.0 52.3	20 88	100 100	0.274 (0.085-0.885)	0.044*
<b>Time since diagnosis</b> - < 1 year - ≥ 1 year	20 26	34.5 52.0	38 24	65.5 48.0	58 50	100 100	0.486 (0.224-1.055)	0.101
<b>Metastasis</b> - Yes - No	15 31	53.6 38.8	13 49	46.4 61.3	28 80	100 100	1.824 (0.765-4.346)	0.253
<b>Cancer wound</b> - No - Yes	33 13	39.3 54.2	51 11	60.7 45.8	84 24	100 100	0.548 (0.219-1.366)	0.286
<b>Pain</b> - No - Yes	13 33	36.1 45.8	23 39	63.9 54.2	36 72	100 100	0.668 (0.293-1.521)	0.023*
<b>Self-Efficacy</b> - Low - High	35 11	71.4 18.6	14 48	28.6 81.4	49 59	100 100	10.909 (4.427-26.883)	0.000*
<b>Social Support</b> - Inadequate - Adequate	32 14	69.6 22.6	14 48	30.4 77.4	46 62	100 100	7.837 (3.298-18.619)	0.000*
<b>Anxiety or depression</b> - Yes - No	17 29	32.1 52.7	36 26	67.9 47.3	53 55	100 100	0.423 (0.194-0.926)	0.048*

**Table 3. Factors associated with self-management.**

Variable	B	SE	Wald	df	p	OR	95% CI
Constant	-4.492	2.261	3.945	1	0.047	0.11	-
Cancer stage	-1.663	0.747	4.952	1	0.026*	0.190	0.044-0.820
Self-efficacy	2.816	0.678	1.247	1	0.000*	16.713	4.424-63.137
Social Support	1.603	0.522	9.416	1	0.002*	4.968	1.785-13.831
Anxiety or depression	0.723	0.651	1.233	1	0.267	2.060	0.575-7.373

#### 4. DISCUSSION

This study provides valuable evidence regarding the self-efficacy and self-management, among other factors including social support and psychological factors, of the breast cancer patients under treatment during the COVID-19 pandemic. In this study, the proportion of breast cancer patients with a high level of self-efficacy was 9.2% higher than that of patients with a low level of self-efficacy. This finding is somewhat similar to a study conducted in Saudi Arabia [33]. However, a study in Turkey found otherwise: the majority of cancer patients undergoing chemotherapy reported having a low level of self-efficacy [34]. Al-Harithy argued that the strong religious faith and the culture of close family ties might contribute to building the self-efficacy of Saudi Arabian cancer patients [33]. This explanation is relevant to the Indonesian context, where most Indonesians are religious and have strong family support.

While the study found that there was a slightly higher percentage of breast cancer patients who had high self-efficacy, it is crucial not to neglect the sizeable population of patients with poor self-efficacy, especially in the context of the COVID-19 pandemic. The pandemic has brought additional challenges and uncertainties for the patients, so they should rely more on their self-efficacy. Recognizing the values of self-efficacy becomes even more important in these circumstances, as it equips the patients with the skills they need to navigate the complexities of the pandemic, make informed decisions about their health, and follow the necessary precautions and treatment regimens. A systematic review has shown that self-efficacy is positively correlated with health-promoting behaviors while being inversely related to physical and psychological symptoms in adolescents and young adults with cancer [35]. Another review of studies in adults with cancer found similar results [17]. Cancer patients with high self-efficacy are also more likely to have better general health and quality of life [17].

A key finding of this study is that self-efficacy is the strongest predictor of self-management among breast cancer patients in the pandemic. This finding is consistent with the results of previous studies assessing patients with chronic diseases, including cancer [33, 36] and diabetes mellitus [37 - 39]. Self-efficacy has been suggested as a useful framework to explain variance in self-management behaviors [19, 40]. According to Bandura's theory, self-efficacy is based on four different types of mastery experiences: *i.e.* enactive experiences, vicarious experiences, verbal persuasion, and physical and emotional states [19]. The representations of illness and its treatments provide a way for the patients to develop these mastery experiences [40]. Cancer patients can build their self-efficacy by actively taking part in their self-management activities, such as following treatment plans and adopting healthy habits. In addition, getting trustworthy verbal persuasion from reputable sources (*e.g.* healthcare professionals) and controlling one's bodily and mental states can all aid in the development of self-efficacy. In addition, patients' self-efficacy can further influence their behaviors through cognitive processes (such as future planning) and motivational processes (such as increased commitment to goals), as well as potentially disruptive affective processes

(such as fear of failure). Therefore, there could be a reciprocal process of self-efficacy affecting behavioral outcomes and vice versa.

Additionally, this study also found that social support is positively associated with self-management in breast cancer patients. Consistently, an increasing number of studies have provided evidence that social support affects, both directly and indirectly, the self-management of cancer patients [41, 42]. Through interactions with their social circles, patients can be persuaded and reinforced to actively manage their illness. A prior study in breast cancer survivors also found that social support can positively influence communication, coping mechanisms, information-seeking, and healthy behaviors through the path of improving self-efficacy [41]. Moreover, a study in Malaysia during the COVID-19 pandemic showed that social support can enhance learning experiences [43]. Strong social support from the closest circle, such as spouses or family members, might compensate for the reduced access to healthcare services.

In this study, another significant association was found between cancer stage and self-management. Patients with a higher stage of breast cancer were more likely to report better self-management. A previous study also showed that self-management differed by cancer stage [44]. Patients with advanced cancer, for example, commonly have a shorter prognosis with more complex treatment regimens, requiring a wider range of self-management strategies, ranging from medication and lifestyle to psychological management such as managing the end of life [45]. Hence, programs to promote self-management should consider the stage of cancer as well as the needs and abilities of the patients and their caregivers.

On the other hand, this study found no significant relationship between anxiety depression and self-management. This finding was quite surprising since psychological status has been suggested as one of the factors affecting self-efficacy, which might in turn influence self-management. However, in line with this study's finding, a meta-analysis conducted by Kim and colleagues found that self-management interventions had no statistically significant effects on anxiety and depression in cancer patients who had completed primary treatments [46]. The authors argued that this insignificant finding might be partly attributed to the minimal or mild levels of anxiety and depression among the patients included in the studies [46]. Those studies in Kim's meta-analysis also did not target anxiety and depression as their primary outcomes. Further studies are needed to provide more evidence regarding how psychological factors may contribute to self-management and how self-management can also improve psychological well-being in cancer patients.

A national program implemented in the Netherlands has shown that improving self-management in patients with chronic illness can provide a significant social return on investment driven as much by the higher quality of life and lower healthcare costs [47]. Among cancer patients, quality of life is a major outcome that can be improved by self-management interventions, as demonstrated by Kim's meta-analysis [46]. However, a more recent meta-analysis showed that self-management interventions using digital means were

only effective for improving self-efficacy and cancer-related fatigue but not quality of life [48]. These various findings may indicate that the link between self-management and well-being is not always straightforward [49]. An increasing body of evidence, nevertheless, has supported the benefits of self-management in patients with chronic diseases, including cancer patients.

Self-management behavior becomes increasingly important for patients with chronic conditions such as breast cancer in the COVID-19 pandemic due to the barriers to accessing healthcare services [50]. In a Dutch longitudinal study conducted before the pandemic in 2018 and during the pandemic in 2020, Menting *et al.* found that people with chronic diseases experienced varied self-management: improved (15.1%), deteriorated (14.2%), and stable (70%) [50]. Consistent with our study findings, social support was significantly related to changes in self-management behavior. The present study findings reiterate the importance of involving spouses, caregivers, or family members in the interventions to improve the self-management behaviors of cancer patients in times of crisis.

This study has some inherent limitations. The cross-sectional design limits the ability of the study to capture changes in self-efficacy and self-management behaviors of breast cancer patients over time, both prior to and during the pandemic. This study design also does not allow for causal inference between variables. Additionally, we only measured self-efficacy in relation to self-management, taking into account social support and psychological factors. Other potentially influential factors, such as access to healthcare resources, might have been missed. Furthermore, this study was less representative due to the limitations of the convenience sampling method. Future trials with robust designs and a sufficient timeframe for evaluation should be conducted to improve the self-management behaviors of breast cancer patients in Indonesia.

## CONCLUSION

It can be concluded that self-efficacy is strongly and positively associated with self-management in breast cancer patients undergoing treatment. The proportion of breast cancer patients with higher and lower levels of self-efficacy and self-management behavior was almost similar. Other factors associated with self-management were social support and the cancer stage.

## IMPLICATIONS FOR NURSING

The findings of this study highlight some implications for nursing care for breast cancer patients. Firstly, nursing interventions focusing on enhancing patients' self-efficacy are needed. Nurses should also assess and address the unique needs of patients with lower self-efficacy. Strategies such as providing tailored education, counseling, and support may improve patients' self-efficacy and self-management behaviors. Nurses should also involve the social support network of the patients, including spouses and family members, in promoting self-management behaviors. Moreover, nurses can also facilitate peer support groups for patients or connect them with

community resources.

One of the lessons learned from the COVID-19 pandemic is the need to adopt telehealth or remote care delivery methods, which can decrease some gaps in case access and equity [51]. Consequently, bolstering patients' self-efficacy is becoming more important. Nursing can play a crucial role in this matter by leveraging technology to deliver personalized education and support. In addition, nurses can also foster a sense of community and connection among breast cancer patients through online peer support groups. Nevertheless, to reduce healthcare inequities, telehealth tools should be designed to address patients' needs and consider the digital divide. Attention should be paid to improving the e-health literacy of breast cancer patients to protect them from misinformation and fraud on virtual platforms.

## AUTHORS' CONTRIBUTIONS

DS carried out the data collection and prepared the first draft of the article. TN conceived and designed the study. DG conducted the analysis and interpretation of the data. AM added the overall interpretation and prepared the final draft of the article. All authors have critically reviewed, revised, and approved the final draft of the paper.

## LIST OF ABBREVIATIONS

<b>WHO</b>	=	World Health Organization
<b>CBI</b>	=	Cancer Behavior Inventory
<b>DASS</b>	=	Depression and Anxiety Stress Scale
<b>ESSI</b>	=	Enrichd Social Support Instruments

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was obtained from the Ethics Committee of the Dharmais National Cancer Center (No. 148/KEPK/VI/2022).

## HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committees and with the 1975 Declaration of Helsinki, as revised in 2013.

## STANDARDS OF REPORTING

STROBE guidelines were followed.

## AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article is available in the [osf.io] at [<https://osf.io/ahyrt/>], reference number [OSF | the Link between Self-Efficacy and Self-Management in Breast Cancer Patients]”.

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## CONFLICT OF INTEREST

All authors declare that they have no conflict of interest.

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