International Journal of Public Health Science (IJPHS)
Vol. 14, No. 4, December 2025, pp. 1710~1719
ISSN: 2252-8806, DOI: 10.11591/ijphs.v14i4.26206

Interventions to improve resilience in breast cancer patients: a systematic review

Dwi Retnaningsih[1], Nursalam[2], Hanik Endang Nihayati[2]
[1]Nursing Study Program, Universitas Widya Husada Semarang, Semarang, Indonesia
[2]Department of Nursing, Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

Article Info

Article history:

Received Nov 4, 2024
Revised Aug 22, 2025
Accepted Nov 3, 2025

Keywords:

Breast cancer
Psychological well-being
Quality of life
Resilience interventions
Systematic review

ABSTRACT

Breast cancer patients with low resilience may experience adverse psychological outcomes, including stress, anxiety, depression, emotional dysregulation, and difficulties in recovery. This systematic review aims to evaluate the effectiveness of various interventions in improving resilience among breast cancer patients and to provide practical guidance for healthcare practitioners in implementing these interventions. Following the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines and PICOS framework, a comprehensive search was conducted across PubMed, Scopus, ScienceDirect, and Google Scholar for studies published between 2018–2024. Two independent reviewers screened eligible studies in two stages (title/abstract and full-text). The methodological quality of included studies was assessed using the Joanna Briggs Institute Critical Appraisal Tool. A total of 20 studies met the inclusion criteria. Interventions identified include music therapy, mindfulness, family and social support programs, cognitive behavioral therapy, digital-based interventions, and psychoeducation. Most interventions demonstrated a significant positive impact on patients' psychological resilience, coping ability, and quality of life. Evidence suggests that resilience-focused interventions can be effectively integrated into supportive care for breast cancer patients. Healthcare practitioners should consider incorporating these strategies to address psychosocial needs. Further studies are recommended to evaluate long-term impacts and cost-effectiveness in diverse settings.

Corresponding Author:

Dwi Retnaningsih
Nursing Study Program, Universitas Widya Husada Semarang
Subali Raya Street, 12, Semarang, Central Java, Indonesia
Email: dwi.retnaningsih@uwhs.ac.id

1. INTRODUCTION

Breast cancer is one of the most prevalent malignancies affecting women worldwide [1]. According to the World Health Organization (WHO), breast cancer is the most common type of cancer in many countries, including Indonesia, and remains a major public health concern [2]. In Indonesia, data from the Global Cancer Observatory (GLOBOCAN) 2020 reported approximately 65,858 new cases of breast cancer, accounting for 16.6% of all cancer diagnoses, with a mortality rate of 9.6% (IARC, 2021). Globally, breast cancer ranks sixth in cancer-related deaths and is the second most common cancer in terms of diagnoses [3], [4]. These statistics highlight the urgency of developing effective interventions to address the physical and psychosocial impact of the disease.

The diagnosis and treatment of breast cancer often result in significant psychological distress, including anxiety, depression, and heightened stress levels [5]. Patients often face challenges such as changes in body image, feelings of loneliness, and uncertainty about prognosis [6]-[8]. In addition to the disease burden, treatment modalities like chemotherapy, surgery, and radiotherapy often result in adverse effects such as fatigue, nausea, hair loss, and weight loss, further exacerbating psychological strain. In Indonesia, unique challenges include limited access to psychosocial support services, cultural stigma, and disparities in health literacy, which may influence patient outcomes.

Resilience, defined as a dynamic process that enables individuals to adapt successfully to adversity, plays a crucial role in helping breast cancer patients cope with the emotional, physical, and psychological challenges of the disease [9]. The resilience model incorporates personal, social, and environmental factors that interact to promote adaptive functioning during illness [10]. Patients with high resilience are more likely to adhere to treatment, maintain hope, and achieve better psychological and clinical outcomes [11]. Conversely, low resilience can lead to increased stress, depression, and difficulty managing emotional distress [12]-[14].

Several resilience-based interventions, such as cognitive behavioral therapy, mindfulness training, social support programs, and psychoeducation, have been developed to address these challenges [15]. However, previous studies often vary in design, target population, and outcome measures, making it difficult to draw definitive conclusions about their effectiveness. There is also limited synthesis of evidence specific to breast cancer patients, particularly in low- and middle-income countries like Indonesia. Therefore, this study aims to systematically review available interventions to enhance resilience among breast cancer patients, identify the most effective approaches, and provide evidence-based guidance for healthcare practitioners.

2. METHOD

We compiled pertinent research on boosting breast cancer patients' resilience through systematic reviews. Utilizing the Joanna Briggs Institute Guidelines and the Centre for Review and Dissemination, we employed the PRISMA checklist of questions to assess the study's quality [16], [17].

2.1. Search strategy and inclusion criteria for systematic reviews

A strategic literature search was conducted using terms such as “resilience,” “breast cancer,” “RCT,” and “stress.” Boolean operators (AND/OR) were applied to refine the search. AND RCT AND Stress; looking for pertinent publications from other references; searching articles in databases like Scopus, Science Direct, ProQuest, and Web of Science. The PICOS criteria (population, intervention, comparison, outcome, and study design) are used to define the inclusion criteria for journal articles published during the previous five years, from 2019 to 2024, as shown in Table 1.

Table 1. Inclusion and exclusion criteria with PICOS

Criteria	Inclusion	Exclusion
Population	breast cancer	Other than breast cancer
Intervention	Increases resistance	There are no exclusion criteria
Comparisons	intragroup, intergroup, in relation to the control group, or in the absence of the control group	There are no exclusion criteria
Outcome	Patients with breast cancer have increased resistance.	No pertinent relationships exist in individuals with cancer
Study type	RCT as well as trials	Studies discussing irrelevant associations in cancer patients were excluded
Type publication	original studies subjected to peer review	Unreviewed research studies
Years	2019 sampai 2024	Pre 2019
Language	English	Languages besides English

795 articles from 4 sources (Scopus, Science Direct, ProQuest, and Web of Science) were found in the search results. One of the twenty-one articles that were assessed did not fit the requirements since it had nothing to do with the study's goal. Twenty papers that satisfy the inclusion criteria and the research topic have been selected for inclusion in this study. The inclusion criteria, which include: i) RCT and experiments published in English-language peer-reviewed journals between 2019 and 2024; ii) study participants with a clinical diagnosis of breast cancer; and iii) interventions promoting resilience, are used to evaluate the title and abstract manuscripts for relevance to the topic. The whole article is reviewed to evaluate if it should be included if the first review's findings do not clearly reveal its relevance. To guarantee that the original article is ultimately included in the review, the entire content is read once it has been gathered. Here, twenty articles satisfy the requirements for inclusion.

2.2. Study selection, data extraction, and management

Determine whether crucial elements, like the research design, systematic review, clinical trials, case control, cross-sectional, case report, descriptive study, and experiment, need to be taken out of each study. Patients with breast cancer made up the sample population. The major results, analytical techniques, and conclusions pertaining to therapies aimed at enhancing patients' resilience in the face of breast cancer. Make a table to include the information gleaned from each study, along with any pertinent details and conclusions pertaining to the subject of the investigation. Make sure that all pertinent data is appropriately captured by meticulously extracting data from each chosen research project.

Once the data is extracted, organize the data systematically in an accessible and manageable format, in the form of tables. Re-verify the extracted data to ensure the accuracy and completeness of the information. accurately identify inconsistencies or ambiguities in the extracted data. Analysis and interpretation of data to extract key findings and conclusions from the studies that have been analyzed. Each study's risk of bias evaluation made use of a technique developed by the Cochrane Collaboration and modified from Sterne *et al*. [18]. This review is limited to studies published in English, which may exclude relevant research in other languages. Additionally, the search and selection process may have missed unpublished or non-indexed studies, and the heterogeneity of study designs limited the ability to perform a meta-analysis.

3. RESULTS AND DISCUSSION

3.1. Study characteristics

Twenty papers satisfy the requirements for review inclusion as shown in Figure 1. RCT studies on breast cancer patients were used to get the articles. Figure 1 shows flow diagrams for the literature selection and search process. Figure 1 illustrates the literature selection process and highlights strategies to enhance resilience among breast cancer patients.

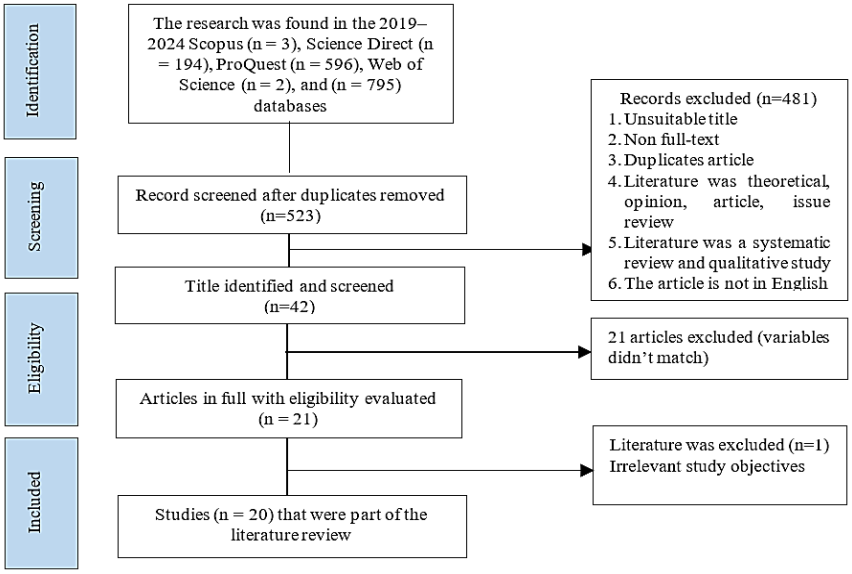

Figure 1. Flow diagram of the literature selection using PRISMA

3.2. Respondent characteristics

All study respondents were breast cancer patients who received interventions aimed at enhancing their resilience. The participants' ages ranged from 18 to 74 years. Detailed information on the respondent characteristics from each included study is presented in Table 2.

3.3. Interventions improve resilience in breast cancer patients

This section presents the findings of the systematic review, organized according to the types of interventions identified across the included studies. The results summarize the characteristics of the selected articles, including study design, participant profile, and intervention components. Interventions are grouped into categories such as psychological therapies, social support programs, and digital-based approaches. The

discussion integrates these findings with existing literature, highlighting the effectiveness, limitations, and potential applications of each intervention in clinical and community settings.

All of the study's participants were patients with breast cancer who received treatments aimed at enhancing their resilience. The research design included a mixed-method, non-randomized RCT. Table 3 lists 20 papers that address therapies aimed at enhancing the resilience of people with breast cancer. Identified interventions included family and social support programs, music therapy, mindfulness, cognitive-behavioral therapy (CBT), digital interventions, and psychoeducational programs, all of which contributed to enhancing resilience among breast cancer patients.

Table 2. Respondent characteristics

No	Library resource	Country	Cancer types	Age (year)	No	Library resource	Country	Cancer types	Age (year)
1	[19]	Spain	Breast cancer	≥18	11	[29]	Iran	Breast cancer	35-55
2	[20]	Turkey	Breast cancer	≥18	12	[30]	China	Breast cancer	≤45
3	[21]	USA	Breast Urogenital Gastrointestinal Lung	≥18	13	[31]	Turkey	Breast cancer	≥25
4	[22]	Italy	Breast cancer	≥18	14	[32]	China	Breast cancer	≥18
5	[23]	Germany	Breast cancer	≥18	15	[33]	Taiwan	Breast cancer	≥20
6	[24]	Taiwan	Breast cancer	≥18	17	[34]	Germany	Breast cancer	25-65
7	[25]	Finland	Breast cancer	25-65	18	[35]	China	Breast cancer	≥18
8	[26]	Japan	Breast cancer	20–74	19	[36]	United Kingdom	Breast Gynecological Prostate Lung Colorectal Gastrointestinal	54.3
9	[27]	USA	Breast cancer	<50	20	[37]	USA	Breast cancer	≥18
10	[28]	Australia	Breast cancer	≥18	21	[38]	Italy	Breast cancer	>26

3.3.1. Family and social support

Cancer patients' well-being has been demonstrated to benefit from familial, spiritual, and social support roles, which include moral, practical, and emotional care from patients' relatives [39], [40]. Social support, trust, and participation in social networking sites can also play important health-related roles [41]. The family is often the primary source of support in the patient's journey during treatment [42]-[44].

The purpose of the study was to assess resilience in cancer patients and the variables that affected it. The study emphasized the value of social support in addition to the effects of tracheotomy, anxiety, depression, and family size on resilience. Resilience was also found to be significantly influenced by formal education and its function in family decision-making [45]. For patients to improve their general health and recover from disease, spouses' emotional support and friends' informed support are crucial [46].

Husbands caring for their spouses with breast cancer may have less stress if they have greater social support, family resilience, and personal resilience [47]-[49]. Cancer patients' quality of life is significantly impacted by family resilience [14], and breast cancer patients have highlighted important information that social networks require in order to effectively assist them. Research has demonstrated a substantial positive correlation between family resilience, the quality of interpersonal communication, and the impression of support from one's spouse [50]. Family-centered lung cancer treatment is recommended, as is the development of appropriate family support networks [51], [52].

Research on the caregiving burden of families with lung cancer patients conducted in China demonstrates the significant impact that family resilience has in mitigating caregiving stress [53]. Good social support can increase family resilience, thereby reducing the burden of nursing and emphasizing the importance of family-centric care [54], [55]. For the relatives of breast cancer patients to be able to adjust and get through the difficulties, family resilience is also essential. It has been demonstrated that family resilience-focused interventions are beneficial in lowering stress, anxiety, and depression while also enhancing social support and problem-solving skills [50]. In addition, improved communication and support between partners can increase family resilience to transitional gynecological cancers. Health services in rural areas may consider expanding transportation assistance and access to benefits to reduce nursing stress [56]. The researchers will also test the effectiveness of family resilience intervention programs that focus on breast cancer patients, including online family gatherings led by trained professionals, which are expected to improve resilience in breast cancer patient families [57].

Comprehending the interplay of psychological, social, and spiritual elements might lead to more all-encompassing and efficacious approaches for addressing mental health issues in cancer patients [58]. Holistic therapy requires acknowledging the importance of spirituality in mental health and rehabilitation in addition

to biological, psychological, and social factors [59]-[61]. The study also covers the variables that affect the burden that Chinese caregivers of lung cancer patients perceive. It also emphasizes the significance of family-centric care and the role that family resilience plays as a mediator between the level of social support and caregiver burden [53].

Table 3. Interventions to enhance the resilience of cancer patients

No	Research	Type of research	Intervention	Clustering intervention
1	[19]	RCT	Peer support program	Family and social support
2	[20]	Pretests and posttests, and a control group	support group intervention	
3	[21]	RCT	Music psychotherapy	Music therapy
4	[22]	RCT	Music intervention	
5	[23]	RCT	Mindful walking	Mindfulness
6	[24]	RCT	Mindfulness-based fitness training program	
7	[25]	A single-group pretest and repeated mid- and post-test	Mindfulness-based Stress reduction	
8	[26]	RCT	Mindfulness-based cognitive therapy intervention	
9	[27]	Nonrandomized	Mindfulness-based Stress reduction	
10	[28]	Mixed-methods uncontrolled study	Cognitive behavioural therapy, acceptance and commitment therapy, mindfulness, and positive psychology	
11	[29]	RCT	Educate the fredrickson positive emotions	
12	[30]	RCT	Psychological intervention	
13	[31]	RCT	Psychosocial intervention	
14	[32]	RCT	Family centered positive psychological intervention	
15	[33]	RCT	Cognitive behavioral Therapy	Cognitive behavioral therapy
16	[34]	RCT	Cognitive behavioral therapy	
17	[35]	RCT	Cyclic adjustment training (CAT) using WeChat for women with breast cancer	Digital-based interventions
18	[36]	RCT	Digital HOPE program	
19	[37]	RCT	Psychoeducational intervention	Psychoeducational intervention
20	[38]	A Mixed Methods Study	Psychoeducational intervention	

3.3.2. Music therapy

Patients with breast cancer frequently have clinically substantial depression and mild anxiety. Following an art-based mandala intervention, they experienced a marked reduction in fear. Nonetheless, their anxiety did not go down, most likely as a result of outside influences like the COVID-19 epidemic. The study's findings showed that although art-based mandala treatments were effective in reducing patients' fear, they were less effective in reducing their anxiety, possibly due to outside factors [62].

Numerous elements, including how optimism, resilience, and social support affect one's well-being, have an impact on the quality of life experienced by cancer patients. These elements are crucial for the flexibility and overall health of patients, and they may be used to develop new therapeutic approaches [46]. In addition, the research highlights the significance of family resilience interventions as a means of assisting relatives of breast cancer patients in better managing their challenges [54]. The report's other papers emphasize the need to identify the emergency profile of patients with gynecological cancer receiving chemotherapy, comprehend their risk factors, and offer suitable psychosocial support services [63].

3.3.3. Mindfulness

Mindfulness is a practice of full consciousness involving attention to current experiences without judgment. Mindfulness is useful in reducing stress, anxiety, and depression, as well as improving emotional and mental well-being. In breast cancer patients, mindfulness helps manage the physical and emotional symptoms associated with the disease and its treatment. Various techniques, such as meditation and yoga, are frequently used, and research shows that mindfulness is effective in improving the quality of life of patients. This section also recommends integrating mindfulness into cancer patient care programs and training medical staff to support these practices. Mindfulness-based stress reduction (MBSR) is an intervention that enhances suffering tolerance and endurance by promoting changes in mindfulness. Resilience is defined as the ability to get back and recover quickly from stress, and mindfulness training has been shown to enhance self-esteem, which shows resilience. However, no research has directly explored the effects of MBSR on suffering tolerance and resilience. MBSR has the potential to equip individuals with protective abilities that strengthen psychological health and reduce the risk of developing future psychopathologies [64]-[66].

Increasing the number of evidence-based psychosocial treatments included in mental health care can help patients gain new skills, become more independent, and be more motivated to recover [67]. The study emphasizes the importance of giving patients a choice and enhancing dialogue between patients and

therapists in mental health care. Evaluation of the effectiveness of interventions is crucial to perfecting and optimizing future resilience programs [68], [69]. The article also discusses different anxiety profiles in patients with gynecological cancer undergoing chemotherapy, emphasizing the importance of assessing anxieties, understanding risk factors, and providing appropriate psychosocial support services [63].

3.3.4. Cognitive behavioral therapy (CBT)

A broad technique called cognitive-behavioral therapy (CBT) reduces negative thought patterns, encourages joyful activities, and improves social and problem-solving skills [70], [71]. Support-expressive group therapy, mindfulness, positive psychology, and attention-based psychotherapy are further therapies. The goals of all these interventions are to improve the ability to solve problems, be self-sufficient, optimistic, and tolerate bad circumstances and emotions. Resistance training has demonstrated benefits for cancer patients' development and post-traumatic endurance, particularly following diagnosis and as the intervention's length increases [72].

Research on patients with breast cancer who underwent CBT revealed reduced feelings of anxiety and sadness and enhanced resilience [73]. This implies that CBT may be a useful strategy for raising breast cancer patients' quality of life. It's normal for women who get a breast cancer diagnosis to have feelings of desperation and anxiety about the future. Having received CBT, though, individuals are able to get over negative ideas and muster the will to battle the illness. They learn how to control their stress and anxiety with the use of CBT, which enhances their quality of life and quickens the healing process. By using this strategy, kids can become more resilient and feel more powerful when faced with obstacles [74]. In chronic pain disorders, CBT is a dominant psychological intervention aimed at helping patients cope with their condition, while MBSR focuses on increasing awareness and experiencing acceptance. In a number of chronic pain problems, attention treatments have demonstrated benefits over traditional treatment; however, further study is required to evaluate their efficacy with CBT [75].

Cancer patients' resilience has been proven to be greatly increased by psychological therapies, including CBT, which has been linked to enhanced quality of life and post-traumatic growth [76], [77]. Furthermore, resilience and psychological treatments have been connected, indicating that a decrease in chronic stress in breast cancer patients may have an effect on the disease's progression [78]. In order to help breast cancer families better adapt and manage the obstacles given by the disease, family resilience interventions have also been recommended [79], underscoring the significance of a comprehensive approach to resilience in the context of breast cancer therapy and care.

3.3.5. Intervention through digital

It has been demonstrated that cyclical adaptation training (CAT) on WeChat enhances psychological resilience and lowers anxiety and despair in breast cancer survivors who have had surgery. CAT improves mental health and general well-being by assisting patients in overcoming the psychological and physical strain of cancer therapy [9]. Rehabilitation institutions may offer patients comprehensive care by integrating physical activity, diet, and CAT through platforms like WeChat. By facilitating simple access and communication, WeChat fosters a sense of support and unity between patients and healthcare professionals. The platform also makes it easy for patients to track their progress, set goals, and receive guidance from their care team. Overall, integrating CAT through WeChat into breast cancer rehabilitation programs can improve patient endurance and quality of life [80]. In conclusion, WeChat’s integration into breast rehabilitation can greatly improve patient experience and recovery outcomes [81].

3.3.6. Psychoeducational intervention

Psychoeducational treatments can benefit cancer patients' physical health in the long run, as well as their quality of life and confidence in the short term. They can also reduce stress, anxiety, and sadness [82]. There are indications that these approaches may be able to address the insomnia issue, even when there have been no appreciable changes in the patient's general quality of life or ability to perform physically. Future studies should look at these findings in more detail [82].

4. CONCLUSION

This systematic review demonstrates that interventions such as mindfulness-based programs, cognitive behavioral therapy, music therapy, psychoeducation, and digital health applications are effective in enhancing resilience, psychological well-being, and quality of life among breast cancer patients. These findings provide strong evidence for integrating resilience-focused strategies into supportive care, thereby enabling healthcare practitioners to address both physical and psychosocial needs in a comprehensive and holistic manner.

However, this review is limited by the inclusion of only English-language studies, potential publication bias, and heterogeneity in study designs and outcome measures. Future research should focus on conducting long-term randomized controlled trials, assessing cost-effectiveness, and adapting interventions to different cultural and healthcare contexts to maximize impact and sustainability. The findings of this review may assist healthcare providers in selecting appropriate resilience-enhancing strategies and support the development of evidence-based psychosocial programs for breast cancer care.

FUNDING INFORMATION

The researcher declares that this study was conducted without any financial support from external funding agencies.

AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Dwi Retnaningsih	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Nursalam		✓			✓	✓		✓	✓	✓		✓		
Hanik Endang Nihayati	✓		✓	✓		✓			✓				✓	

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo: **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, DR, upon reasonable request. The data are not publicly available due to reasonable restrictions related to participant confidentiality and ethical considerations.

REFERENCES

[1] Sopik V., "International variation in breast cancer incidence and mortality in young women.," *Breast Cancer Research and Treatment.*, vol. 2, no. 186, pp. 497–507., 2020.
[2] A. K. M. Claessens *et al.*, "Quality of life in a real-world cohort of advanced breast cancer patients: a study of the SONABRE Registry," *Quality of Life Research*, vol. 29, no. 12, pp. 3363–3374, 2020, doi: 10.1007/s11136-020-02604-4.
[3] J. Huang *et al.*, "Global incidence and mortality of breast cancer: a trend analysis," *Aging*, vol. 13, no. 4, pp. 5748–5803, Feb. 2021, doi: 10.18632/aging.202502.
[4] U. Dafni, Z. Tsourti, and I. Alatsathianos, "Breast cancer statistics in the European Union: Incidence and survival across European countries," *Breast Care*, vol. 14, no. 6, pp. 344–353, 2019, doi: 10.1159/000503219.
[5] D. C. McFarland, "New lung cancer treatments (immunotherapy and targeted therapies) and their associations with depression and other psychological side effects as compared to chemotherapy," *General Hospital Psychiatry*, vol. 60, pp. 148–155, Sep. 2019, doi: 10.1016/j.genhosppsych.2019.04.001.
[6] M. Borgi, B. Collacchi, E. Ortona, and F. Cirulli, "Stress and coping in women with breast cancer: unravelling the mechanisms to improve resilience," *Neuroscience & Biobehavioral Reviews*, vol. 119, pp. 406–421, 2020, doi: 10.1016/j.neubiorev.2020.10.011.
[7] J. A. Suskin *et al.*, "Anxiety trajectories: An observational study of women undergoing chemotherapy for breast or gynecological cancer," *European Journal of Oncology Nursing*, vol. 61, 2022, doi: 10.1016/j.ejon.2022.102227.
[8] M. R. Irwin, R. Olmstead, J. Kruse, E. C. Breen, and R. Haque, "Association of interleukin-8 and risk of incident and recurrent depression in long-term breast cancer survivors," *Brain, Behavior, and Immunity*, vol. 105, pp. 131–138, Oct. 2022, doi: 10.1016/j.bbi.2022.07.003.
[9] Z. Wang, Y. Chen, and L. Min, "The interventions for resilience of breast cancer patients : a systematic review and meta-analysis," *Research Square*, pp. 1–31, 2021, [Online]. Available: https://www.researchsquare.com/article/rs-396869/v1
[10] A. Seiler and J. Jenewein, "Resilience in cancer patients," *Frontiers in Psychiatry*, vol. 10, 2019, doi: 10.3389/fpsyt.2019.00208.
[11] H. Balci and Ş. B. Şener, "Resilience in women who underwent breast cancer surgery," *Akdeniz Medical Journal*, pp. 347–353, 2022, doi: 10.53394/akd.1059556.
[12] Z. D. Hammood *et al.*, "Breast cancer recurrence 27 years after full recovery; A case report with literature review," *International Journal of Surgery Case Reports*, vol. 92, 2022, doi: 10.1016/j.ijscr.2022.106827.

[13] K. Clifton *et al.*, "Loneliness, social isolation, and social support in older adults with active cancer during the COVID-19 pandemic," *Journal of Geriatric Oncology*, vol. 13, no. 8, pp. 1122–1131, Nov. 2022, doi: 10.1016/j.jgo.2022.08.003.
[14] J. Ke, J. Lin, X. Lin, W. Chen, and F. Huang, "Dyadic effects of family resilience on quality of life in patients with lung cancer and spousal caregivers: The mediating role of dyadic coping," *European Journal of Oncology Nursing*, vol. 66, p. 102400, Oct. 2023, doi: 10.1016/j.ejon.2023.102400.
[15] D. Zhang, Y. Tian, R. Wang, L. Wang, P. Wang, and Y. Su, "Effectiveness of a resilience-targeted intervention based on 'I have, I am, I can' strategy on nursing home older adults' suicidal ideation: A randomized controlled trial," *Journal of Affective Disorders*, vol. 308, pp. 172–180, 2022, doi: 10.1016/j.jad.2022.04.046.
[16] M. J. Page *et al.*, "The PRISMA 2020 statement: an updated guideline for reporting systematic reviews," *BMJ*, p. n71, Mar. 2021, doi: 10.1136/bmj.n71.
[17] M. S. Cumpston, J. E. McKenzie, J. Thomas, and S. E. Brennan, "Current practice in systematic reviews including the 'PICO for each synthesis' and methods other than meta-analysis: protocol for a cross-sectional study," *F1000Research*, vol. 9, p. 678, Jul. 2020, doi: 10.12688/f1000research.24469.1.
[18] J. A. C. Sterne *et al.*, "RoB 2: a revised tool for assessing risk of bias in randomised trials," *BMJ*, vol. 366, p. l4898, Aug. 2019, doi: 10.1136/bmj.l4898.
[19] I. Aizpurua-Perez *et al.*, "A randomized controlled trial of the effectiveness of a one-to-one peer support intervention on resilience, social support, and salivary cortisol in recently diagnosed women with breast cancer," *European Journal of Oncology Nursing*, vol. 71, p. 102616, Aug. 2024, doi: 10.1016/j.ejon.2024.102616.
[20] F. Erol Ursavaş and Ö. Karayurt, "Effects of a roy's adaptation model–guided support group intervention on sexual adjustment, body image, and perceived social support in women with breast cancer," *Cancer Nursing*, vol. 44, no. 6, pp. E382–E394, Nov. 2021, doi: 10.1097/NCC.0000000000000854.
[21] J. F. Mondanaro *et al.*, "The effects of clinical music therapy on resiliency in adults undergoing infusion: a randomized, controlled trial," *Journal of Pain and Symptom Management*, vol. 61, no. 6, pp. 1099–1108, 2021, doi: 10.1016/j.jpainsymman.2020.10.032.
[22] P. Zeppegno *et al.*, "Psychotherapy with music intervention improves anxiety, depression and the redox status in breast cancer patients undergoing radiotherapy: a randomized controlled clinical trial," *Cancers*, vol. 13, no. 8, p. 1752, 2021, doi: 10.3390/cancers13081752.
[23] M. Ortiz, M. L. Schröder, B. Brinkhaus, and B. Stöckigt, "Implementation of a mindful walking intervention in breast cancer patients after their primary oncologic treatment: results of a qualitative study within a randomized controlled trial," *Integrative Cancer Therapies*, vol. 23, Jan. 2024, doi: 10.1177/15347354241237972.
[24] Y.-C. Chang, "Effectiveness of integrated mindfulness-based fitness training program in ameliorating physical symptoms and survivor concerns in patients with breast cancer," *Cancer Nursing*, vol. 48, no. 3, pp. 159–170, 2025, doi: 10.1097/NCC.0000000000001285.
[25] S. E. Sakki, H. M. Penttinen, O. M. Hilgert, S.-M. Volanen, T. Saarto, and A. Raevuori, "Mindfulness is associated with improved psychological well-being but no change in stress biomarkers in breast cancer survivors with depression: a single group clinical pilot study," *BMC Women's Health*, vol. 22, no. 1, p. 518, Dec. 2022, doi: 10.1186/s12905-022-02116-y.
[26] N. Tamura *et al.*, "Predictors and moderators of outcomes in mindfulness-based cognitive therapy intervention for early breast cancer patients," *Palliative and Supportive Care*, vol. 20, no. 2, pp. 159–166, Apr. 2022, doi: 10.1017/S147895152100078X.
[27] E. Elimimian *et al.*, "Long-term effect of a nonrandomized psychosocial mindfulness-based intervention in hispanic/latina breast cancer survivors," *Integrative Cancer Therapies*, vol. 19, Jan. 2020, doi: 10.1177/1534735419890682.
[28] N. Tuckey *et al.*, "Implementing a group-based online mental well-being program for women living with and beyond breast cancer – A mixed methods study," *Asia-Pacific Journal of Clinical Oncology*, vol. 21, no. 2, pp. 180–189, Apr. 2025, doi: 10.1111/ajco.14060.
[29] M. Raoufi, M. R. Seyrafi, and H. Ahadi, "Effectiveness of Frederickson positive excitement training on resilience and psychological capital of patients with breast cancer," *Avicenna Journal of Neuro Psycho Physiology*, vol. 9, no. 3, pp. 103–109, Jul. 2022, doi: 10.32592/ajnpp.2022.9.3.102.
[30] H. Fang, Y. Zeng, Y. Liu, and C. Zhu, "The effect of the PERMA model-based positive psychological intervention on the quality of life of patients with breast cancer," *Heliyon*, vol. 9, no. 6, p. e17251, Jun. 2023, doi: 10.1016/j.heliyon.2023.e17251.
[31] Y. S. Üzar-Özçetin and D. Hiçdurmaz, "Effects of an empowerment program on resilience and posttraumatic growth levels of cancer survivors," *Cancer Nursing*, vol. 42, no. 6, pp. E1–E13, Nov. 2019, doi: 10.1097/NCC.0000000000000644.
[32] Y. Zhang *et al.*, "Effects of family-centered positive psychological intervention on psychological health and quality of life in patients with breast cancer and their caregivers," *Supportive Care in Cancer*, vol. 31, no. 10, p. 592, 2023, doi: 10.1007/s00520-023-08053-2.
[33] H.-L. Lai, C.-I. Chen, C.-Y. Lu, and C.-Y. Huang, "Cognitive behavioral therapy plus coping management for depression and anxiety on improving sleep quality and health for patients with breast cancer," *Brain Sciences*, vol. 11, no. 12, p. 1614, Dec. 2021, doi: 10.3390/brainsci11121614.
[34] F. Jelvehzadeh, E. R. Dogaheh, C. Bernstein, S. Shakiba, and H. Ranjbar, "The effect of a group cognitive behavioral therapy on the quality of life and emotional disturbance of women with breast cancer," *Supportive Care in Cancer*, vol. 30, no. 1, pp. 305–312, Jan. 2022, doi: 10.1007/s00520-021-06421-4.
[35] K. Zhou, J. Li, and X. Li, "Effects of cyclic adjustment training delivered via a mobile device on psychological resilience, depression, and anxiety in Chinese post-surgical breast cancer patients," *Breast Cancer Research and Treatment*, vol. 178, no. 1, pp. 95–103, Nov. 2019, doi: 10.1007/s10549-019-05368-9.
[36] H. Wright *et al.*, "A digital self-management program (help to overcome problems effectively) for people living with cancer: feasibility randomized controlled trial," *Journal of Medical Internet Research*, vol. 23, no. 11, p. e28322, Nov. 2021, doi: 10.2196/28322.
[37] K. T. Ashing and M. George, "Exploring the efficacy of a paraprofessional delivered telephonic psychoeducational intervention on emotional well-being in African American breast cancer survivors," *Supportive Care in Cancer*, vol. 28, no. 3, pp. 1163–1171, Mar. 2020, doi: 10.1007/s00520-019-04899-7.
[38] S. Cipolletta, C. Simonato, and E. Faccio, "The effectiveness of psychoeducational support groups for women with breast cancer and their caregivers: A mixed methods study," *Frontiers in Psychology*, vol. 10, no. FEB, 2019, doi: 10.3389/fpsyg.2019.00288.
[39] P. Macía, M. Barranco, S. Gorbeña, and I. Iraurgi, "Expression of resilience, coping and quality of life in people with cancer," *PLOS One*, vol. 15, no. 7, p. e0236572, Jul. 2020, doi: 10.1371/journal.pone.0236572.
[40] N. P. W. Purnama Sari and M. Manungkalit, "The effect of family appraisal on caregiver burden in family caregiver of female cancer patients," *International Journal of Public Health Science (IJPHS)*, vol. 12, no. 2, p. 890, 2023, doi: 10.11591/ijphs.v12i2.22788.
[41] H. Rahayu, S. Yona, and Masfuri, "The social support, spirituality, stress, and family burden of cancer patients in Jakarta hospitals," *Enfermería Clínica*, vol. 31, pp. S234–S238, Apr. 2021, doi: 10.1016/j.enfcli.2020.12.029.
[42] H. Son, S. Hong, M. Hong, and S. G. Silva, "Measure of perceived social support from family, friends, and healthcare providers for Korean adolescents and young adults with cancer," *Asia-Pacific Journal of Oncology Nursing*, vol. 10, no. 7, 2023, doi: 10.1016/j.apjon.2023.100244.

[43] T. Hinton, S. Burns-Nader, D. Casper, and W. Burton, "Memories of adult survivors of childhood cancer: Diagnosis, coping, and long-term influence of cancer," *Journal of Psychosocial Oncology*, vol. 40, no. 5, pp. 652–665, 2022, doi: 10.1080/07347332.2022.2032530.
[44] X. Zhao, M. Sun, and Y. Yang, "Effects of social support, hope, and resilience on depressive symptoms within 18 months after diagnosis of prostate cancer," *Health and Quality of Life Outcomes*, vol. 19, no. 1, 2021, doi: 10.1186/s12955-020-01660-1.
[45] N. Zahid *et al.*, "Resilience and its associated factors in head and neck cancer patients in Pakistan: an analytical cross-sectional study," *BMC Cancer*, vol. 21, no. 1, 2021, doi: 10.1186/s12885-021-08624-8.
[46] I. Ruiz-Rodríguez, I. Hombrados-Mendieta, A. Melguizo-Garín, and M. J. Martos-Méndez, "The importance of social support, optimism and resilience on the quality of life of cancer patients," *Frontiers in Psychology*, vol. 13, Mar. 2022, doi: 10.3389/fpsyg.2022.833176.
[47] P. Cui, J. Shi, S. Li, M. A. Getu, R. Wang, and C. Chen, "Family resilience and its influencing factors among advanced cancer patients and their family caregivers: a multilevel modeling analysis," *BMC Cancer*, vol. 23, no. 1, p. 623, Jul. 2023, doi: 10.1186/s12885-023-11101-z.
[48] L. Tao, X. Hu, H. Chen, S. Xiao, and X. Zhang, "Factors influencing the burden on spousal caregivers of breast cancer survivors," *Supportive Care in Cancer*, vol. 30, no. 9, pp. 7789–7799, Sep. 2022, doi: 10.1007/s00520-022-07130-2.
[49] M. Kim and S. Ahn, "Do spouse burden of care, family resilience, and coping affect family function in gynecologic cancer in Korea?: a cross-sectional study," *Korean Journal of Women Health Nursing*, vol. 28, no. 3, pp. 197–209, Sep. 2022, doi: 10.4069/kjwhn.2022.08.03.
[50] X. Chen, Y. Li, H. Sun, T. Wang, X. Xu, and M. Li, "Dyadic communication quality and family resilience in gynecologic cancer survivors: a study on the mediating role of perceived spousal support," *Supportive Care in Cancer*, vol. 31, no. 1, p. 68, Jan. 2023, doi: 10.1007/s00520-022-07492-7.
[51] Y. Zhang *et al.*, "Relationships among perceived social support, family resilience, and caregiver burden in lung cancer families: a mediating model," *Seminars in Oncology Nursing*, vol. 39, no. 3, 2023, doi: 10.1016/j.soncn.2022.151356.
[52] S. Opsomer, S. Joossens, E. Lauwerier, J. De Lepeleire, and P. Pype, "Resilience in advanced cancer caregiving promoted by an intimate partner's support network: insights through the lens of complexity science. A framework analysis," *BMC Palliative Care*, vol. 22, no. 1, p. 12, Feb. 2023, doi: 10.1186/s12904-023-01134-3.
[53] Y. Zhang *et al.*, "Relationships among perceived social support, family resilience, and caregiver burden in lung cancer families: a mediating model," *Seminars in Oncology Nursing*, vol. 39, no. 3, p. 151356, Jun. 2023, doi: 10.1016/j.soncn.2022.151356.
[54] J. Gao *et al.*, "A randomized controlled trial of a coping-focused family resilience intervention program for breast cancer patients: Study protocol," *Frontiers in Psychology*, vol. 13, 2022, doi: 10.3389/fpsyg.2022.968154.
[55] H.-T. Hsu, C.-H. Juan, J.-L. Chen, and H.-F. Hsieh, "Mediator roles of social support and hope in the relationship between body image distress and resilience in breast cancer patients undergoing treatment: a modeling analysis," *Frontiers in Psychology*, vol. 12, Sep. 2021, doi: 10.3389/fpsyg.2021.695682.
[56] Y. Qian, S. Asad, E. M. Park, J. A. Mills, and E. E. Kent, "Rural resilience during COVID-19: the lived experience of North Carolinian rural-dwelling cancer caregivers," *Supportive Care in Cancer*, vol. 31, no. 7, p. 396, Jul. 2023, doi: 10.1007/s00520-023-07840-1.
[57] J. Gao *et al.*, "A randomized controlled trial of a coping-focused family resilience intervention program for breast cancer patients: Study protocol," *Frontiers in Psychology*, vol. 13, Oct. 2022, doi: 10.3389/fpsyg.2022.968154.
[58] N. P. W. P. Sari, "Spiritual wellbeing in breast and cervical cancer survivors: differences in each stage of survivorship," *International Journal of Public Health Science (IJPHS)*, vol. 8, no. 4, p. 441, Dec. 2019, doi: 10.11591/ijphs.v8i4.20311.
[59] K. Milner, P. Crawford, A. Edgley, L. Hare-Duke, and M. Slade, "The experiences of spirituality among adults with mental health difficulties: a qualitative systematic review," *Epidemiology and Psychiatric Sciences*, vol. 29, p. e34, May 2020, doi: 10.1017/S2045796019000234.
[60] M. K. Gislason, A. M. Kennedy, and S. M. Witham, "The interplay between social and ecological determinants of mental health for children and youth in the climate crisis," *International Journal of Environmental Research and Public Health*, vol. 18, no. 9, p. 4573, Apr. 2021, doi: 10.3390/ijerph18094573.
[61] V. Rivi, G. Rigillo, Y. Toscano, C. Benatti, and J. Blom, "Narrative review of the complex interaction between pain and trauma in children: a focus on biological memory, preclinical data, and epigenetic processes," *Children*, vol. 10, no. 7, p. 1217, Jul. 2023, doi: 10.3390/children10071217.
[62] H. K. Yakar, B. Yilmaz, O. Ozkol, F. Gevher, and E. Celik, "Effects of art-based mandala intervention on distress and anxiety in cancer patients," *Complementary Therapies in Clinical Practice*, vol. 43, p. 101331, May 2021, doi: 10.1016/j.ctcp.2021.101331.
[63] R. A. Pozzar *et al.*, "Associations between distinct state anxiety profiles, exposure to stressful life events, resilience, and coping in patients with gynecologic cancers receiving chemotherapy," *Seminars in Oncology Nursing*, vol. 39, no. 4, p. 151431, Aug. 2023, doi: 10.1016/j.soncn.2023.151431.
[64] J. Galante, J. Stochl, G. Dufour, M. Vainre, A. P. Wagner, and P. B. Jones, "Effectiveness of providing university students with a mindfulness-based intervention to increase resilience to stress: 1-year follow-up of a pragmatic randomised controlled trial," *Journal of Epidemiology and Community Health*, vol. 75, no. 2, pp. 151–160, Feb. 2021, doi: 10.1136/jech-2020-214390.
[65] X. Liu *et al.*, "Reducing psychological stress of chinese adolescents by mindfulness-based intervention: the mediating role of resilience," *Child & Youth Care Forum*, vol. 52, no. 2, pp. 351–370, Apr. 2023, doi: 10.1007/s10566-022-09690-0.
[66] C. K. Kokou-Kpolou *et al.*, "Enacted ebola stigma and health-related quality of life in post ebola epidemic: a psychosocial mediation framework through social support, self-efficacy, and coping," *Applied Research in Quality of Life*, vol. 17, no. 5, pp. 2809–2832, Oct. 2022, doi: 10.1007/s11482-022-10039-x.
[67] C. H. Oedegaard *et al.*, "'It means so much for me to have a choice': a qualitative study providing first-person perspectives on medication-free treatment in mental health care," *BMC Psychiatry*, vol. 20, no. 1, p. 399, Dec. 2020, doi: 10.1186/s12888-020-02770-2.
[68] C. Bramwell *et al.*, "How can NHS trusts in England optimise strategies to improve the mental health and well-being of hospital doctors? The Care Under Pressure 3 (CUP3) realist evaluation study protocol," *BMJ Open*, vol. 13, no. 11, p. e073615, Nov. 2023, doi: 10.1136/bmjopen-2023-073615.
[69] Babajide Tolulope Familoni and Sodiq Odetunde Babatunde, "User experience (ux) design in medical products: theoretical foundations and development best practices," *Engineering Science & Technology Journal*, vol. 5, no. 3, pp. 1125–1148, Mar. 2024, doi: 10.51594/estj.v5i3.975.
[70] L. Ma, Y. Zhang, C. Huang, and Z. Cui, "Resilience-oriented cognitive behavioral interventions for depressive symptoms in children and adolescents: A meta-analytic review," *Journal of Affective Disorders*, vol. 270, pp. 150–164, 2020, doi: 10.1016/j.jad.2020.03.051.
[71] P. Ludolph, A. M. Kunzler, J. Stoffers-Winterling, I. Helmreich, and K. Lieb, "Interventions to promote resilience in cancer patients," *Deutsches Ärzteblatt international*, vol. 116, no. 51–52, pp. 865–872, Dec. 2019, doi: 10.3238/arztebl.2019.0865.

[72] A. J. Howell and H.-A. Passmore, "Acceptance and commitment training (ACT) as a positive psychological intervention: a systematic review and initial meta-analysis regarding ACT's role in well-being promotion among university students," *Journal of Happiness Studies*, vol. 20, no. 6, pp. 1995–2010, Aug. 2019, doi: 10.1007/s10902-018-0027-7.
[73] M. C. C. Onyedibe, A. C. Nkechi, and C. M. Ifeagwazi, "Effectiveness of group cognitive-behavioral therapy on anxiety and depression in nigerian breast cancer patients," *International Journal of Psychology and Psychological Therapy*, vol. 20, no. 2, 2020.
[74] I. Aizpurua-Perez and J. Perez-Tejada, "Resilience in women with breast cancer: A systematic review," *European Journal of Oncology Nursing*, vol. 49, p. 101854, Dec. 2020, doi: 10.1016/j.ejon.2020.101854.
[75] E. M. Pardos-Gascón, L. Narambuena, C. Leal-Costa, and C. J. van-der Hofstadt-Román, "Differential efficacy between cognitive-behavioral therapy and mindfulness-based therapies for chronic pain: Systematic review," *International Journal of Clinical and Health Psychology*, vol. 21, no. 1, p. 100197, Jan. 2021, doi: 10.1016/j.ijchp.2020.08.001.
[76] F. E. Janitra, N. Aini, and A. L. Wicaksana, "Resilience-related breast cancer: a concept analysis," *Nurse Media Journal of Nursing*, vol. 13, no. 1, pp. 31–55, Apr. 2023, doi: 10.14710/nmjn.v13i1.45996.
[77] E. Mészáros Crow *et al.*, "Psychosocial interventions reduce cortisol in breast cancer patients: systematic review and meta-analysis," *Frontiers in Psychology*, vol. 14, Jun. 2023, doi: 10.3389/fpsyg.2023.1148805.
[78] L. Xiang, H. Wan, Y. Zhu, M. Zheng, X. Li, and S. Wang, "Effects of cognitive behavioral therapy on adult cancer patients' resilience: a systematic review and meta-analysis." Apr. 11, 2023. doi: 10.21203/rs.3.rs-2705225/v1.
[79] S. S. Almeida, M. A. Oliveira, R. Medeiros, M. P. Guerra, C. M. Pariante, and L. Fernandes, "Emotional, inflammatory, and genetic factors of resilience and vulnerability to depression in patients with premenopausal breast cancer: A longitudinal study protocol," *PLOS ONE*, vol. 18, no. 2, p. e0279344, Feb. 2023, doi: 10.1371/journal.pone.0279344.
[80] Y. Jiang *et al.*, "Evaluating an intervention program using WeChat for patients with chronic obstructive pulmonary disease: randomized controlled trial," *Journal of Medical Internet Research*, vol. 22, no. 4, p. e17089, Apr. 2020, doi: 10.2196/17089.
[81] J. Bayuo, F. K. Y. Wong, and L. Y. F. Chung, "Effects of a nurse-led transitional burns rehabilitation programme (4Cs-TBuRP) for adult burn survivors: protocol for a randomised controlled trial," *Trials*, vol. 22, no. 1, 2021, doi: 10.1186/s13063-021-05679-7.
[82] Q. Cheng, B. Xu, M. S. N. Ng, Y. Duan, and W. K. W. So, "Effectiveness of psychoeducational interventions among caregivers of patients with cancer: A systematic review and meta-analysis," *International Journal of Nursing Studies*, vol. 127, p. 104162, Mar. 2022, doi: 10.1016/j.ijnurstu.2021.104162.

BIOGRAPHIES OF AUTHORS

Dwi Retnaningsih is a senior lecturer in the nursing study program, Universitas Widya Husada Semarang, Semarang, Central Java, Indonesia, who concentrates on researching health and nursing issues both in the community setting and in health services. The author published several books, conducted research, and community service activities in nursing. She can be contacted at: dwi.retnaningsih@uwhs.ac.id.

Nursalam is a professor of the Faculty of Nursing, Universitas Airlangga. His research interests are mainly focused on nursing management, basic and medical surgical nursing, and critical nursing. He is an active member and the head of the Association of Indonesian Nurses Education Center (AINEC) and the Indonesian National Nurses Association (Persatuan Perawat Nasional Indonesia (PPNI)) in East Java Province. He has written the books Nursing Management, Research Methodology in Nursing, English for Nursing, and Nursing Care for HIV/AIDS. He can be contacted at email: nursalam@fkp.unair.ac.id.

Hanik Endang Nihayati is a senior lecturer in the Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia. Her research interests are mainly focused on nursing, mental health nursing, and adolescents. She is an active member of the Indonesian National Nurses Association (*Persatuan Perawat Nasional Indonesia* (PPNI)) in East Java Province. She published several books, research, and dedication in the field of nursing. She can be contacted at email: hanik-e-n@fkp.unair.ac.id.