Contents lists available at Science-Gate

International Journal of Advanced and Applied Sciences

Journal homepage: http://www.science-gate.com/IJAAS.html

Effectiveness of the Relax-ATM intervention in reducing anxiety and stress and improving readiness for chemotherapy

Hilman Syarif [1, *], Jufrizal Jufrizal [2], Elka Halifah [3], Novi Afrianti [1], Dewiyuliana Dewiyuliana [1]

[1]Department of Medical-Surgical Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia
[2]Department of Emergency Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia
[3]Department of Maternity Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia

A B S T R A C T

Chemotherapy is a common treatment for cancer, but it often leads to significant side effects, including psychological distress such as anxiety and stress, which may reduce patients' readiness for treatment. Non-pharmacological interventions, including relaxation techniques, have shown promise in managing these effects. This study evaluated the effectiveness of the Relax-ATM intervention package—a combination of Benson relaxation, aromatherapy, and foot massage—in reducing anxiety and stress and enhancing chemotherapy readiness. A quasi-experimental design was used involving 60 breast cancer patients undergoing at least their second chemotherapy cycle at a referral hospital in Aceh Province, Indonesia, between September and October 2024. Participants were divided equally into intervention and control groups. The intervention group received the Relax-ATM package, while the control group received standard care. Results indicated significant reductions in anxiety (mean score: 8.83 ± 2.33 vs. 11.10 ± 3.26, p = 0.003) and stress (14.70 ± 2.17 vs. 18.67 ± 5.29, p = 0.001), as well as significant improvements in physical (8.03 ± 0.62 vs. 7.40 ± 1.01, p = 0.005) and psychological (8.00 ± 0.83 vs. 7.40 ± 1.00, p = 0.014) readiness for chemotherapy in the intervention group. These findings suggest that the Relax-ATM intervention is an effective non-pharmacological approach to improve emotional well-being and treatment preparedness in breast cancer patients undergoing chemotherapy.

1. Introduction

Cancer, a non-communicable disease, is characterized by malignant cells or tissues that grow uncontrollably and can invade other parts of the body. Cancer cells disrupt tissue function and can spread via blood or lymphatic vessels, forming tumor masses from various organ components. Rapid growth and development of cancer cells can impair the body's metabolism and extend to other tissues and organs.

Breast cancer is one of the most prevalent cancers globally, accounting for significant morbidity and mortality (Winasis and Djuwita, 2023). In 2022, approximately 670,000 deaths were attributed to breast cancer worldwide, with about half of all cases occurring in women without specific risk factors other than age and gender (WHO, 2024). While rare in men, accounting for only 1% of cases, breast cancer in women predominantly occurs between the ages of 40 and 49, with only 5% of cases diagnosed before the age of 35 (Nurrohmah et al., 2022). The World Health Organization (WHO) reported that cancer was the leading cause of death globally in 2020, with nearly 10 million deaths, including 2.26 million new breast cancer cases and 6.85 million associated deaths (WHO, 2022). Similarly, GLOBOCAN data in 2024 revealed 20 million new cancer cases and 9.7 million deaths globally, with lung and breast cancers contributing the highest mortality rates. In 2050, cancer cases are anticipated to increase to 35 million annually.

In Indonesia, cancer ranks as the third leading cause of death after stroke and heart disease, with 408,000 new cases and 242,000 deaths annually. Breast cancer is the most common cancer among women, with an incidence rate of 16.3 per 100,000 women, constituting 51% of all female cancer cases. In 2020, breast cancer resulted in over 22,000

deaths in Indonesia. Local data from Dr. Zainoel Abidin Hospital in Banda Aceh highlighted 10,800 cancer patients in 2021, with breast cancer, ovarian cancer, and non-Hodgkin lymphoma being the most common diagnoses.

One of the primary treatment modalities for cancer is chemotherapy, which is practical but often accompanied by numerous adverse effects, including psychological distress such as anxiety and stress. Psychological challenges such as anxiety can begin at diagnosis and persist during treatment and recovery, potentially leading to severe emotional distress or even suicidal ideation. Anxiety may stem from uncertainty about treatment outcomes, concerns about side effects, and fear of disease progression and mortality. Manifestations of these psychological effects include anger, sadness, depression, and mood swings. Anxiety not only affects patients' psychological well-being but also interferes with their medical recovery and can lead to discontinuation of chemotherapy.

Non-pharmacological interventions, such as relaxation techniques, have been shown to alleviate the psychological side effects of chemotherapy, promoting comfort and well-being. Benson relaxation, a widely used relaxation technique, combines effective breathing with positive phrases to reduce stress and improve mental health. Benson relaxation effectively reduces anxiety in cancer patients (Fatmawati and Sugianto, 2023). Benson relaxation inhibits sympathetic activity, reduces oxygen demand, relaxes muscles, and promotes a sense of calmness and comfort. This technique redirects attention toward relaxation, effectively reducing pain perception and emotional distress. It is a flexible method that can be applied individually, in groups, or with guidance. By focusing on repetitive phrases or words while eliminating distractions, Benson's relaxation induces a sense of calmness and peace. Research by Sriningsih and Pratiwi (2022) showed that there was a significant effect of applying the Benson relaxation technique on anxiety levels.

Additionally, aromatherapy is a complementary relaxation strategy that employs essential oils to enhance physical and psychological well-being. In cancer patients, aromatherapy is effective in relieving anxiety (Li et al., 2022). Aromatherapy is a therapeutic technique that uses natural aromatic substances and essential plant oils to promote physical, mental, and emotional well-being (Khamis et al., 2023). Aromatherapy can stimulate the formation of serotonin, putting a person in a more comfortable and relaxed state. Specifically, rose aromatherapy has been associated with calming, palliative, and sleep-inducing properties, thereby serving as an effective adjunct in managing anxiety and stress. Research by Aragão et al. (2023) reported that aromatherapy was shown to have a positive and significant impact on relieving anxiety symptoms in women undergoing breast cancer treatment.

Furthermore, foot massage represents another intervention that can be synergistically combined with Benson relaxation and aromatherapy to amplify relaxation and alleviate psychological distress. According to the results of research by Indraswati et al. (2024), massage therapy can be utilized as a supporting method or holistic approach for cancer patients to help reduce fatigue caused by disease progression and the effects of chemotherapy treatment. This technique stimulates tactile body tissues and activates the parasympathetic nervous system, facilitating relaxation and comfort. Empirical evidence suggests that foot massage helps create a sense of calm and relaxation, stimulates the release of happiness-boosting chemicals such as dopamine and serotonin, and reduces the production of stress-related hormones. Notably, foot massage stimulates the Hypothalamic-Pituitary Axis (HPA), inducing the release of cortisol and endorphins that modulate the autonomic nervous system, thereby diminishing sympathetic activity and enhancing parasympathetic responses. Such physiological interactions culminate in improved blood circulation, reduced physical discomfort, and enhanced sleep quality (Agung et al., 2020).

Banda Aceh, the capital of Aceh Province, has experienced a significant rise in breast cancer cases, alongside an increasing number of patients undergoing chemotherapy. Despite this, there is limited research on the impact of relaxation interventions to address chemotherapy-induced psychological problems, such as anxiety and stress. The Relax-ATM intervention package was developed by recognizing this gap, combining Benson relaxation, aromatherapy, and foot massage to reduce psychological distress and improve patients' readiness for chemotherapy. This study aims to evaluate the effectiveness of the Relax-ATM intervention package in alleviating anxiety and stress and enhancing readiness to undergo chemotherapy among breast cancer patients.

2. Methodology

This study employs a quasi-experimental design to evaluate the efficacy of the Relax-ATM Intervention Package in alleviating anxiety, stress, and enhancing readiness for chemotherapy among breast cancer patients. The study population comprised all breast cancer patients undergoing at least their second cycle of chemotherapy at a referral hospital in Aceh Province during September and October 2024, totaling 60 participants. A total sampling method was utilized, resulting in 30 respondents assigned to the treatment group and 30 to the control group. The positioning of respondents in the groups was randomized, i.e., respondents who came on Monday, Wednesday, and Friday were included in the intervention group. Respondents who came on Tuesday, Thursday, and Saturday were included in the control group. Both groups received standard care without differences, but the intervention group received the Relax-ATM Intervention Package. The intervention implemented in this study—the Relax-ATM Intervention

Package—integrates Benson relaxation techniques, aromatherapy, and foot massage. At the initial meeting, the researcher provided an overview of the study's purpose, and participants were required to sign an informed consent form. Thereafter, respondents completed questionnaires assessing anxiety, stress, and readiness to undergo chemotherapy, which constituted the pretest data.

The Relax-ATM Intervention Package commenced with placing aromatherapy on the patient's table, encouraging the participant to engage with the aroma for 10 minutes. This therapy was followed by 20 minutes of guided Benson relaxation intertwined with Dhikr. Subsequently, the researcher administered right and left foot massages for 20 minutes. On the second day, the researcher repeated the Relax-ATM Intervention Package procedures. Participants then departed the hospital, and during the subsequent chemotherapy cycle, the intervention was administered again on the first and second days. After the intervention, respondents completed the same questionnaires to provide post-test data. Conversely, the control group only completed the questionnaires at the pretest and post-test phases with no additional interventions.

The measuring instrument utilized in this study was the Depression Anxiety Stress Scale (DASS) 42, developed by Lovibond and Lovibond (1995). The DASS consists of 42 items that assess an individual's levels of stress, anxiety, and depression, with anxiety and stress being measured through 14 respective items. Each statement is scored on a scale of 0 to 3, culminating in a maximum score of 42 for anxiety and stress. The total scores are subsequently categorized into several levels: normal (0-7), mild (8-9), moderate (10-14), severe (15-19), and very severe (20 or higher) for anxiety; and normal (0-14), mild (15-18), moderate (19-25), severe (26-33), and very severe (34 or higher) for stress. This measurement tool is standardized and has been translated into Indonesian. Marsidi (2021) tested this questionnaire, demonstrating a positive Pearson correlation coefficient exceeding 0.532 across all stress, anxiety, and depression items. The reliability of the instrument, assessed using Cronbach's alpha, indicated values of 0.951 for stress, 0.943 for anxiety, and 0.952 for depression. Readiness to undergo chemotherapy was evaluated on a numeric rating scale from 0 to 10, with higher scores indicating greater preparedness.

Comprehensive data analysis was conducted employing the t-test statistical method to rigorously assess the differences in levels of anxiety, stress, and readiness to adhere to chemotherapy protocols between the two distinct groups of respondents. This analytical approach facilitates a nuanced understanding of the psychological and behavioral factors influencing patient compliance and overall well-being during cancer treatment.

3. Result

Table 1 provides an overview of the demographic characteristics of the study respondents, offering insights into the sample population and the implications of the research findings. Table 1 presents the average age of participants in the intervention group as 47.70 years ± 8.65 and in the control group as 49.50 years ± 8.81. Furthermore, a substantial proportion of respondents reported having completed secondary education (53.3%), identifying as Aceh ethnicity (81.7%), being married (73.3%), currently employed (66.7%), undergoing a fifth cycle of chemotherapy (38.3%), and experiencing menopause (58.3%).

Table 1: Characteristics of respondents (n=60)

No.	Variable	Intervention group	Control group	Total
1	Age, years (mean and SD)	47.70 ± 8.65	49.5 ± 8.81	
2	Education (n and %)			
	Basic school	3 (10.0)	2 (6.7)	5 (8.3)
	Junior and Senior school	14 (46.7)	18 (60.0)	32 (53.3)
	High education	13 (43.3)	10 (33.3)	23 (38.4)
3	Ethnicity			
	Aceh	24 (80.0)	25 (83.3)	49 (81.7)
	Java	1 (3.3)	3 (10.0)	4 (6.7)
	Gayo	5 (16.7)	2 (6.7)	7 (11.7)
4	Marital status			
	Married	23 (76.7)	21 (70.0)	44 (73.3)
	Widow	7 (23.3)	9 (30.0)	16 (26.7)
5	Occupation			
	Employed	18 (60.0)	22 (73.3)	40 (66.7)
	Unemployed	12 (40.0)	8 (26.7)	20 (33.3)
6	Chemotherapy cycles			
	Second	9 (30.0)	11 (36.7)	20 (33.3)
	Third	4 (13.3)	3 (10.0)	7 (11.7)
	Fourth	4 (13.3)	6 (20.0)	10 (16.7)
	Fifth	13 (43.3)	10 (33.3)	23 (38.3)
7	Menopausal status			
	Yes	16 (53.3)	19 (63.3)	35 (58.3)
	No	14 (46.7)	11 (36.7)	25 (41.7)

The mean anxiety score at the initial assessment for the intervention group was 10.73 ± 3.47, whereas the control group had a mean score of 11.57 ± 3.36. The comparison of anxiety scores between the two groups revealed no statistically significant difference (p = 0.349). Similarly, the mean stress score at the first measurement for the intervention group was 19.10 ± 5.09, compared to 19.30 ± 5.68 for the

control group, with no significant difference observed in stress scores (p = 0.886). Regarding physical readiness, the intervention group exhibited a mean score of 7.50 ± 1.00, while the control group had a mean of 7.37 ± 0.997. Again, the difference between groups was not statistically significant, with p = 0.609. Lastly, the mean score for psychological readiness in the intervention group was 7.60 ± 1.16, in contrast to 7.40 ± 1.00 for the control group, which also showed no significant difference (p = 0.479) (Table 2). The mean anxiety score, as measured at the second assessment, was 8.83 ± 2.33 in the intervention group, while the control group exhibited a mean score of 11.10 ± 3.26. A statistically significant difference in anxiety scores was observed between the two groups, with a p-value of 0.003. Regarding stress, the mean score at the second

measurement for the intervention group was 14.70 ± 2.17, in contrast to the control group, which recorded a mean score of 18.67 ± 5.29. This difference in stress scores was also statistically significant, with a p-value of 0.001. Regarding physical readiness, the mean score for the intervention group at the second measurement was 8.03 ± 0.62, compared to the control group's mean score of 7.40 ± 1.01. A significant difference in physical readiness scores was found between the groups, with a p-value of 0.005. Lastly, the mean psychological readiness score for the intervention group was 8.00 ± 0.83, while the control group had a mean score of 7.40 ± 1.00. This difference in psychological readiness scores was statistically significant, with a p-value of 0.014 (Table 3).

Table 2: Score of anxiety, stress, and readiness to follow chemotherapy on first measurement (n=60)

No.	Variable	Intervention group	Control group	P-value
1	Anxiety (mean and SD)	10.73 ± 3.47	11.57 ± 3.36	0.349
2	Stress (mean and SD)	19.10 ± 5.09	19.30 ± 5.68	0.886
3	Physical readiness (mean and SD)	7.50 ± 1.00	7.37 ± 0.99	0.609
4	Psychological readiness (mean and SD)	7.60 ± 1.16	7.40 ± 1.00	0.479

Table 3: Score of anxiety, stress, and readiness to follow chemotherapy on the second measurement (n=60)

No.	Variable	Intervention group	Control group	P-value
1	Anxiety (mean and SD)	8.83 ± 2.33	11.10 ± 3.26	0.003
2	Stress (mean and SD)	14.70 ± 2.17	18.67 ± 5.29	0.001
3	Physical readiness (mean and SD)	8.03 ± 0.62	7.40 ± 1.01	0.005
4	Psychological readiness (mean and SD)	8.00 ± 0.83	7.40 ± 1.00	0.014

4. Discussion

Cancer treatment through chemotherapy typically necessitates a prolonged period of care and management. The side effects associated with chemotherapy are often most pronounced within the first week following treatment, likely contributing to increased levels of anxiety and stress. Such psychological states can adversely affect patients' mental well-being and may exacerbate physical symptoms, including nausea and vomiting, by stimulating the cerebral cortex. Consequently, anxiety and stress can compromise the patient's resolve to persist with chemotherapy (Siregar et al., 2024). Addressing these psychological challenges is essential for supporting patients undergoing chemotherapy. The Relax-ATM intervention package, which includes Benson relaxation, aromatherapy, and foot massage, has demonstrated efficacy in alleviating anxiety and stress, thereby enhancing patients' willingness to adhere to treatment regimens.

Benson relaxation is a form of therapy that can be used to reduce fatigue in patients experiencing breast cancer. This finding follows previous research, which conducted Benson relaxation for seven days in the treatment group respondents. The results showed a significant reduction in fatigue in the intervention group compared to the control group (Cahyono et al., 2022). The same information was also reported by the results of research by Nazari et al. (2023), which showed a significant change and decrease in symptoms felt by breast

cancer patients, such as fatigue, vomiting, nausea, pain, anorexia, and other side effects after doing Benson relaxation. In addition, Benson's relaxation can also improve the quality of life and decrease anxiety scores in cancer patients. The research results from Huddar et al. (2023) also proved that Benson relaxation combined with progressive muscle relaxation is proven to reduce fatigue and anxiety in cancer patients in Belagavi.

The findings from the study indicate a statistically significant reduction in anxiety levels among patients receiving the intervention compared to those in the control group (p = 0.003). Specifically, the mean anxiety score in the intervention group was 8.83 ± 2.33, markedly lower than the control group's score of 11.10 ± 3.26. These results underscore the effectiveness of the Relax-ATM intervention package in mitigating anxiety among cancer patients undergoing chemotherapy. This finding is consistent with previous research indicating that complementary interventions can serve as effective nursing strategies for addressing chemotherapy-related psychological challenges. Healthcare providers can use aromatherapy to help reduce anxiety arising from patients undergoing chemotherapy (Aragão et al., 2023). Benson relaxation, a fundamental component of the Relax-ATM intervention package, is widely acknowledged for reducing anxiety, tension, and stress. Benson relaxation combined with other non-pharmacological therapies, such as aromatherapy, has been shown to reduce the average level of anxiety in breast cancer patients. The results of

another study showed a significant reduction in anxiety in patients with breast cancer (Fang et al., 2022), which reported that Benson relaxation significantly diminished patient anxiety levels (p = 0.001). Similarly, Ebrahimi and Adib-Hajbaghery (2022) noted substantial reductions in anxiety among cancer patients in Iran following the application of Benson relaxation therapy, with significant improvements observed at six- and ten-week post-intervention.

In addition to alleviating stress and anxiety, the implementation of Benson relaxation techniques has been shown to enhance patient readiness for chemotherapy on both physical and psychological dimensions. The study results indicated significant differences in physical readiness scores (p = 0.005) and psychological readiness (p = 0.0014) between the two groups before and after applying Benson relaxation. These findings are corroborated by Nazari et al.'s (2023) research, illustrating the beneficial impacts of Benson relaxation on breast cancer patients' physical and psychological states. Furthermore, the method of Benson relaxation has also been noted for its potential to improve sleep quality, appetite, anxiety levels, and overall quality of life.

Benson relaxation is a form of non-pharmacological therapy that is conducted to reduce the anxiety that arises by focusing on a focus and repeating specific sentences. The sentences spoken are sentences that have been agreed upon with the patient. Benson's relaxation, combined with the patient's belief, helps inhibit the work of sympathetic nerves, and oxygen consumption is reduced, which causes the muscles to relax, providing calmness and comfort to the patient (Fatmawati and Sugianto, 2023). Nurses and other health professionals can use Benson relaxation or other therapies as part of routine patient care to reduce anxiety (Moradi et al., 2023).

The physiological mechanisms underlying Benson relaxation include modulation of hypothalamic activity, increasing parasympathetic nervous system activity, and suppressing sympathetic responses. This physiological shift leads to a decrease in adrenaline levels and an increase in the production of endorphins and serotonin, contributing to muscle relaxation and reductions in heart rate and blood pressure. By facilitating physical and psychological relaxation, Benson relaxation has demonstrated notable advantages in alleviating anxiety and enhancing patients' preparedness for chemotherapy.

When combined with aromatherapy, Benson's relaxation further amplifies the therapeutic effects of both interventions. As part of the Relax-ATM intervention package, aromatherapy has been shown to foster comfort, relaxation, and focus, effectively complementing Benson's relaxation (Hedigan et al., 2023). In research conducted by Pereira et al. (2022), women with breast cancer showed stability in anxiety reduction over time and improvement in their quality of life after being given aromatherapy.

Aromatherapy involves inhaling aromatic compounds that engage the olfactory system and convey signals to the brain's limbic system. This mechanism facilitates the release of neurotransmitters, including serotonin and dopamine, which are instrumental in alleviating anxiety and enhancing emotional well-being (Cui et al., 2022). Aromatherapy that can be used includes lavender, lemon, and peppermint. Lavender is considered more effective as it contains essential oils that alleviate pain, headaches, sleep disorders, tension, stress, nausea, vomiting, and fatigue.

Research has additionally demonstrated the effectiveness of integrating aromatherapy with spiritual components, such as Qur'anic recitation, in mitigating anxiety and stress among cancer patients (Siregar et al., 2024). Incorporating spiritual practices, particularly Dhikr (remembrance of God), augments the relaxation effects associated with the Relax-ATM intervention package. Prior studies by Kamal and Dahlia (2020) indicated that the auditory experience of Qur'anic recitation activates the parasympathetic nervous system, equilibrating autonomic functions and promoting relaxation. This engagement is linked to increased levels of serotonin and gamma-aminobutyric acid (GABA), both of which mitigate anxiety and support emotional stability. The therapeutic advantages of spiritual practices transcend momentary relaxation, providing patients with a more profound sense of peace and spiritual connectedness. Siregar et al. (2024) reported significant reductions in anxiety levels among cancer patients' post-Qur'anic recitation therapy, underscoring the modality's potential as a complementary intervention.

Foot massage, another integral component of the Relax-ATM intervention package, alleviates the physical discomfort and psychological stress associated with chemotherapy. This practice stimulates vasodilation and mitigates muscle tension, alleviating nausea, vomiting, and pain. A previous study demonstrated that foot massage effectively reduces chemotherapy-induced nausea and vomiting while improving sleep quality and decreasing anxiety (Yükseltürk Şimşek et al., 2022). Foot massage can significantly reduce anxiety in patients after reflexology is performed in the intervention group, compared to before the intervention. Neural theory states that certain reflex stimuli on the feet can affect the nervous system and cause a fight-or-flight response. Experts believe that reflexology on the feet stimulates the secretion of endorphins, which reduces pain and increases comfort.

The therapeutic benefits of foot massage can be attributed to its capacity to engage the hypothalamic-pituitary-adrenal (HPA) axis, which oversees cortisol and endorphin production. Such hormonal transformations activate the parasympathetic nervous system, facilitating relaxation and diminishing sympathetic activity. Furthermore, foot massage has been found to enhance blood circulation, improve quality of life,

and provide comfort and healing to cancer patients (Oshvandi et al., 2021).

The Relax-ATM intervention package exemplifies the potential of complementary therapies in tackling the multifaceted challenges encountered by cancer patients undergoing chemotherapy. As posited by Purnamayanti and Putra (2021), the effective management of chemotherapy side effects necessitates a multifarious approach that includes environmental modifications, exercise, mood regulation, and supportive care. Complementary therapies, such as those encompassed within the Relax-ATM intervention package, offer a comprehensive means of enhancing treatment outcomes and quality of life for individuals with cancer. Some evidence has shown that combined treatments of activity therapy, meditation exercises, and elements of psychoeducation, behavioral interventions, and movement training help address the problems that arise in patients with breast cancer (Di Nardo et al., 2022).

The current study's findings are consistent with those articulated by Wahyuni et al. (2023), who accentuated the significance of incorporating complementary therapies within cancer care paradigms. The Relax-ATM intervention package not only alleviates anxiety and stress but also bolsters patients' preparedness for chemotherapy, thereby contributing to improved treatment adherence and outcomes.

The strength of the Relax-ATM intervention package in this study is the formulation of an intervention package that is very easy to implement by nurses in various service settings. In addition, the respondents can do it independently after being taught by the nurses, both when hospitalized and after returning home. A limitation of this study is the relatively short duration of implementation of the Relax-ATM intervention package. Several previous studies have reported that the implementation of a longer duration of intervention provides benefits that are felt longer by respondents. Future researchers need to consider a longer duration.

In conclusion, the Relax-ATM intervention package illustrates the substantial potential for reducing anxiety and stress among cancer patients undergoing chemotherapy. By synergistically integrating Benson relaxation techniques, aromatherapy, and foot massage, this holistic approach addresses physical and psychological challenges, enhancing patients' overall well-being and readiness for treatment. Future investigations could further explore such interventions' long-term benefits and scalability across diverse clinical contexts.

5. Conclusion

The Relax-ATM intervention package, encompassing Benson relaxation, aromatherapy, and foot massage, demonstrates significant efficacy in alleviating anxiety and stress among cancer patients, thereby augmenting their preparedness for chemotherapy. This comprehensive approach addresses critical psychological and physical challenges, providing a holistic and evidence-based framework for nursing care. By implementing these relaxation techniques, the intervention mitigates the adverse effects associated with chemotherapy, fosters overall well-being, and enhances treatment adherence. Nursing professionals must incorporate the Relax-ATM intervention package into standard care protocols for patients experiencing chemotherapy-induced anxiety. Furthermore, the ongoing development of nursing interventions should continue to integrate various relaxation techniques customized to the specific needs of patients. Emphasizing the management of environments and activities is essential for establishing a supportive care framework. Future research should explore these interventions' scalability, long-term impacts, and adaptability across various healthcare settings to enhance patient outcomes and overall quality of life.

Compliance with ethical standards

Ethical considerations

The ethical clearance for this study was approved by the Health Research Ethics Committee of Dr. Zainoel Abidin Hospital (approval letter number 179/ETIK-RSUZA/2023). All participants provided written informed consent prior to participation.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

Agung FY, Aprina A, and Astuti T (2020). Effectiveness of foot massage on sleep quality among post-surgical patients in Dr. H Abdul Moeloek Hospital, Lampung-Indonesia. Malahayati International Journal of Nursing and Health Science, 3(2): 94-102. https://doi.org/10.33024/minh.v3i2.3465

Aragão VM, Lima MMS, Fernandes CDS, Barros LM, Rodrigues AB, and Caetano JÁ (2023). Effects of aromatherapy on anxiety symptoms in women with breast cancer: A systematic review. Texto and Contexto-Enfermagem, 32: e20220132. https://doi.org/10.1590/1980-265x-tce-2022-0132en

Cahyono HD, Irawaty D, and Adam M (2022). The effect of Benson relaxation application ('Bens app') on reducing fatigue in patients with breast cancer undergoing chemotherapy: A quasi-experimental study. Belitung Nursing Journal, 8(4): 304–310. https://doi.org/10.33546/bnj.1843 PMid:37546495 PMCid:PMC10401370

Cui J, Li M, Wei Y, Li H, He X, Yang Q, Li Z, Duan J, Wu Z, Chen Q, Chen B (2022). Inhalation aromatherapy via brain-targeted nasal delivery: Natural volatiles or essential oils on mood disorders. Frontiers in Pharmacology, 13: 860043. https://doi.org/10.3389/fphar.2022.860043 PMid:35496310 PMCid:PMC9041268

Di Nardo P, Lisanti C, Garutti M, Buriolla S, Alberti M, Mazzeo R, and Puglisi F (2022). Chemotherapy in patients with early breast cancer: Clinical overview and management of long-

term side effects. Expert Opinion on Drug Safety, 21(11): 1341–1355. https://doi.org/10.1080/14740338.2022.2151584 **PMid:36469577**

Ebrahimi B and Adib-Hajbaghery M (2022). Effect of Benson's relaxation technique on anxiety in family caregivers of patients with cancer: A randomized controlled trial. Nursing and Midwifery Studies, 11(1): 37–43.

Fang J, Yu C, Liu J, Mao X, Jia X, Luo J, and Liu R (2022). A systematic review and meta-analysis of the effects of muscle relaxation training vs. conventional nursing on the depression, anxiety and life quality of patients with breast cancer. Translational Cancer Research, 11(3): 548–558. https://doi.org/10.21037/tcr-22-428 **PMid:35402172 PMCid:PMC8990220**

Fatmawati DA and Sugianto E (2023). Penerapan terapi relaksasi Benson terhadap penurunan nyeri pada pasien kanker di Yayasan Kanker Inisiatif Zakat Indonesia Semarang. Jurnal Manajemen Asuhan Keperawatan, 7(1), 46-51. https://doi.org/10.33655/mak.v7i1.138

Hedigan F, Sheridan H, and Sasse A (2023). Benefit of inhalation aromatherapy as a complementary treatment for stress and anxiety in a clinical setting–A systematic review. Complementary Therapies in Clinical Practice, 52: 101750. https://doi.org/10.1016/j.ctcp.2023.101750 **PMid:37031643**

Huddar V, Vernekar S, Tatpati N, Thali S, and D'Silva PV (2023). Comparative effect of progressive relaxation technique and Benson's technique on anxiety and fatigue in cancer survivors-an experimental study. Current Problems in Cancer, 47(1): 100933. https://doi.org/10.1016/j.currproblcancer.2022.100933 **PMid:36563484**

Indraswati I, Septiyan RB, Matchaya P, and Finch R (2024). Effectiveness of massage therapy on fatigue in cancer patients undergoing chemotherapy: Scoping review. Jurnal Berita Ilmu Keperawatan, 17(1): 82–91. https://doi.org/10.23917/bik.v17i1.3817

Kamal AF and Dahlia D (2020). The effectiveness of psychoreligious intervention: Murottal Al-Quran on pain and stress level of bone cancer patient. Indonesian Journal of Global Health Research, 2(4): 375-384. https://doi.org/10.37287/ijghr.v2i4.260

Khamis EAR, Raddaha AHA, Nafae WH, Al-Sabeely AA, Ebrahim EE, and Elhadary SM (2023). Effectiveness of aromatherapy in early palliative care for oncology patients: Blind controlled study. Asian Pacific Journal of Cancer Prevention, 24(8): 2729–2739. https://doi.org/10.31557/APJCP.2023.24.8.2729 **PMid:37642059 PMCid:PMC10685211**

Li D, Li Y, Bai X, Wang M, Yan J, and Cao Y (2022). The effects of aromatherapy on anxiety and depression in people with cancer: A systematic review and meta-analysis. Frontiers in Public Health, 10: 853056. https://doi.org/10.3389/fpubh.2022.853056 **PMid:35757624 PMCid:PMC9215260**

Lovibond SH and Lovibond PF (1995). Manual for the depression anxiety stress scales. 2nd Edition, Psychology Foundation, Sydney, Australia. https://doi.org/10.1037/t01004-000

Marsidi SR (2021). Identification of stress, anxiety, and depression levels of students in preparation for the exit exam competency test. Journal of Vocational Health Studies, 5(2): 87-93. https://doi.org/10.20473/jvhs.V5.I2.2021.87-93

Moradi Y, Jafarizadeh H, Asghari R, Mirzamohammadi O, and Alinejad V (2023). Single and combined use of Benson relaxation technique and oxygen therapy on chemotherapy-induced nausea and vomiting in gastric cancer patients. Explore, 19(4): 587-593. https://doi.org/10.1016/j.explore.2022.11.006 **PMid:36535861**

Nazari AM, Zare-Kaseb A, Arbabi Z, Gholampour MH, Emami Zeydi A, and Ghazanfari MJ (2023). The effect of Benson relaxation technique on cancer patients: A systematic review. Supportive Care in Cancer, 31(12): 681. https://doi.org/10.1007/s00520-023-08142-2 **PMid:37938356**

Nurrohmah A, Aprianti A, and Hartutik S (2022). Risk factors of breast cancer. Gaster, 20(1): 1-10. https://doi.org/10.30787/gaster.v20i1.777

Oshvandi K, Mirzajani Letomi F, Soltanian AR, and Shamsizadeh M (2021). The effects of foot massage on hemodialysis patients' sleep quality and restless leg syndrome: A comparison of lavender and sweet orange essential oil topical application. Journal of Complementary and Integrative Medicine, 18(4): 843-850. https://doi.org/10.1515/jcim-2020-0121 **PMid:33838094**

Pereira M, Moreira CS, Izdebski P, Dias AC, Nogueira-Silva C, and Pereira MG (2022). How does hedonic aroma impact long-term anxiety, depression, and quality of life in women with breast cancer? A cross-lagged panel model analysis. International Journal of Environmental Research and Public Health, 19(15): 9260. https://doi.org/10.3390/ijerph19159260 **PMid:35954612 PMCid:PMC9368225**

Purnamayanti NKD, Putra MG, and Haryani H (2021). Complementary and alternative therapy to reduce fatigue among oncology patient under chemotherapy: A nursing perspective. Indonesian Contemporary Nursing Journal (ICON Journal), 6(1): 38-46.

Siregar AN, Syaputri MH, Putri MA, Azizah N, and Jannah TDR (2024). Studi literatur: Murottal Al-Quran sebagai penurun kecemasan pada pasien pengidap kanker. Catha: Journal of Creative and Innovative Research, 1(3): 211-219.

Sriningsih N and Pratiwi A (2022). Pengaruh terapi relaksasi Benson terhadap kecemasan pasien pre operasi di RSUD Kab Tangerang. Jurnal Ilmu Kedokteran Dan Kesehatan Indonesia, 2(3): 50-61. https://doi.org/10.55606/jikki.v2i3.697

Wahyuni S, Rahma A, Aminanto S, and Triyanto A (2023). Penggunaan terapi komplementer dalam meningkatkan outcome perawatan pasien dengan kanker payudara: Scoping review. Jurnal Keperawatan Klinis dan Komunitas (Clinical and Community Nursing Journal), 7(1): 1-10. https://doi.org/10.22146/jkkk.79810

WHO (2022). Breast cancer statistics. World Health Organization, Geneva, Switzerland.

WHO (2024). Breast cancer. World Health Organization, Geneva, Switzerland.

Winasis A and Djuwita R (2023). Obesitas dan kanker payudara: Literature review. Media Publikasi Promosi Kesehatan Indonesia (MPPKI), 6(8): 1501-1508. https://doi.org/10.56338/mppki.v6i8.3501

Yükseltürk Şimşek N, Nacir B, and Demir A (2022). Determining the effect of reflexology on nausea, vomiting and anxiety in patients with breast cancer receiving chemotherapy: A randomized controlled study. Complementary Medicine Research, 29(5): 382-392. https://doi.org/10.1159/000525034 **PMid:35609525**