



The Impact of Mindfulness Butterfly Hug Therapy on Anxiety Levels in Hypertensive Elderly: Findings from a Pre-Experimental Study

Siti Juwariyah¹✉, Maya Cobalt Angio Septianingtyas¹, Vivi Sovianti¹

¹ Nursing Program Study, Universitas Telogorejo Semarang, Semarang City, Central Java, Indonesia

Info Article

Article History:

4 May 2026

Accepted:

29 June 2026

Published:

30 June 2026

Keywords:

Anxiety

Butterfly Hug

Elderly

Hypertension

Mindfulness

Abstract

Psychological distress, particularly anxiety, is common among elderly individuals with hypertension and may negatively affect their quality of life and disease management. This study aimed to examine changes in anxiety levels following Mindfulness Butterfly Hug Therapy among hypertensive elderly individuals. A pre-experimental one-group pretest-posttest design was conducted involving 97 elderly participants with hypertension from a community health center in Semarang, Indonesia. Participants received Mindfulness Butterfly Hug Therapy for 15 minutes over three consecutive days. Anxiety levels were assessed using the Hamilton Anxiety Rating Scale (HARS) before and after the intervention. Data were analyzed using paired t-tests. The results demonstrated a statistically significant reduction in anxiety scores, with mean HARS scores decreasing from 31.94 before the intervention to 16.53 after the intervention (mean difference = 15.41, $p = 0.001$). Most participants shifted from higher levels of anxiety to mild or no anxiety following the intervention. These findings suggest that Mindfulness Butterfly Hug Therapy may be associated with reduced anxiety levels among hypertensive elderly individuals and may serve as a practical non-pharmacological approach in community healthcare settings. However, due to the use of a one-group pretest-posttest design without a comparison group, causal conclusions cannot be drawn. Further controlled studies are warranted to confirm these findings and assess long-term outcomes.

Corresponding Author:

✉ Siti Juwariyah

Nursing Program Study, Universitas Telogorejo Semarang, Semarang City, Central Java, Indonesia

Email: jujuk@universitastelogorejo.ac.id

1. INTRODUCTION

Hypertension is one of the most prevalent non-communicable diseases among the elderly and a major contributor to morbidity and mortality worldwide. As individuals age, they experience physiological, psychological, and social changes that may increase vulnerability to chronic diseases such as hypertension (Satapathy et al., 2025; Celano et al., 2016). In addition to its physical complications-including cardiovascular, renal, and cerebrovascular damage-hypertension is also closely linked to psychological consequences, especially anxiety and psychosocial distress (Juwariyah, 2025).

Elderly individuals, defined as those aged 60 years and above, undergo a natural degenerative process that affects physical, psychological, and social functioning. One of the most common conditions in this age group is hypertension, which results from structural changes in the cardiovascular system, including decreased vascular elasticity and impaired blood circulation (Maryuni, 2020). Beyond its physical impact, hypertension also contributes to psychological distress, particularly anxiety, stress, and even depression (Harisa, 2023).

Data from community health center in Semarang indicate that hypertension is the most prevalent non-communicable disease among the elderly, with increasing cases recorded monthly (Laka, 2020). For example, in April 2024 alone, 234 cases were documented, with a higher incidence in elderly women. These numbers reflect a significant public health concern that requires both physiological and psychological interventions (Lumintang, 2023).

Anxiety in the elderly with hypertension is often triggered by fear of illness progression, physical limitations, social isolation, and loss of independence. According to the Indonesian Ministry of Health, anxiety affects 6.9% of individuals aged 55–65, increasing to 13.4% among those over 75. If left untreated, chronic anxiety can lead to depression, decreased treatment adherence, and poor health outcomes. Therefore, addressing psychological well-being is essential in comprehensive hypertension management, particularly in community and primary care settings (Pristianto, 2022).

Although mindfulness-based interventions have demonstrated benefits in reducing anxiety across various populations, evidence regarding the application of Mindfulness Butterfly Hug Therapy among hypertensive elderly individuals remains limited. Previous studies have primarily focused on trauma survivors, adolescents, and general adult populations, while studies involving elderly individuals with chronic conditions such as hypertension are still scarce. Furthermore, little evidence is available regarding the feasibility of implementing this intervention in community-based primary healthcare settings in Indonesia. Therefore, further investigation is needed to examine changes in anxiety levels following Mindfulness Butterfly Hug Therapy among hypertensive elderly individuals.

According to the Ministry of Health of Indonesia (2018), anxiety among older adults remains high: 6.9% in those aged 55–65, 9.7% in those aged 65–75, and 13.4% in individuals aged over 75. Anxiety is typically characterized by persistent worry, restlessness, difficulty concentrating, insomnia, and somatic symptoms such as chest tightness and shortness of breath (Girianto et al., 2021). If unaddressed, psychosocial problems in the elderly may lead to more serious mental health disorders, including depression and suicidal ideation, especially in those experiencing the loss of a spouse or diminished social support (Firmawati et al., 2025).

Non-pharmacological approaches such as mindfulness-based interventions have emerged as effective strategies for managing anxiety (Goyal et al., 2014; Hofmann et al., 2010; Khoury et al., 2015). One such technique, known as the Mindfulness Butterfly Hug Therapy, combines deep breathing and bilateral stimulation through rhythmic arm tapping.

This method has been used to promote emotional regulation, reduce anxiety, and improve resilience, especially in trauma-related interventions (Raniasmi, 2023).

One widely recommended non-pharmacological intervention is deep breathing, which helps control panic symptoms by increasing oxygen saturation and promoting calmness (Sumartha, 2024). Building upon this principle, Mindfulness Butterfly Hug Therapy integrates deep breathing with bilateral self-stimulation and positive affirmations. This technique has shown promise in reducing emotional distress, improving self-regulation, and promoting psychological resilience (Hofmann et al., 2010).

In community settings, particularly among hypertensive elderly individuals, implementing simple and low-cost interventions such as the Mindfulness Butterfly Hug could be a feasible strategy to reduce anxiety. This study aims to evaluate the effectiveness of Mindfulness Butterfly Hug Therapy as a non-pharmacological intervention to reduce anxiety in hypertensive elderly using a one-group pretest–posttest design (Ramdhani & Soleman, 2023).

Despite growing interest in mindfulness therapies, limited evidence exists regarding their application in elderly populations with hypertension, particularly in community settings. This study aims to evaluate the effect of Mindfulness Butterfly Hug Therapy as a non-pharmacological intervention to reduce anxiety in hypertensive elderly individuals using a one-group pretest–posttest design (Maryuni, 2020).

Unlike previous studies that primarily investigated Butterfly Hug interventions among trauma survivors, students, or general adult populations, this study focuses specifically on hypertensive elderly individuals, a population experiencing both chronic physical illness and elevated psychological vulnerability. In addition, the intervention was implemented in a community healthcare setting, providing practical evidence regarding its applicability within primary healthcare services.

Despite growing evidence supporting mindfulness-based interventions for anxiety management, research examining the use of Mindfulness Butterfly Hug Therapy among elderly individuals with hypertension remains limited. Existing studies have largely focused on trauma-related conditions, students, or general adult populations, with relatively little attention given to older adults living with chronic cardiovascular conditions. Furthermore, evidence regarding the implementation of this intervention within community-based healthcare settings is still scarce, particularly in Indonesia. Given the high prevalence of anxiety among hypertensive elderly individuals and the need for accessible non-pharmacological interventions, further investigation is warranted.

This study addresses this gap by examining changes in anxiety levels following the implementation of Mindfulness Butterfly Hug Therapy among hypertensive elderly individuals in a community healthcare setting. The findings are expected to contribute to the growing evidence base on mindfulness-based interventions and provide practical insights for integrating low-cost psychological support strategies into elderly healthcare services.

2. METHOD

This study employed a pre-experimental one-group pretest–posttest design to evaluate the effect of Mindfulness Butterfly Hug Therapy on anxiety levels in hypertensive elderly individuals. Setting and Participants, the study was conducted from January 13 to 15, 2025, at community health center in Semarang, Central Java, Indonesia. All eligible participants meeting the inclusion criteria during the study period were invited to participate, resulting in a final sample of 97 respondents. A total of 97 elderly participants diagnosed with hypertension were recruited through purposive sampling based on the following inclusion criteria: Aged ≥ 60 years, Diagnosed with hypertension, Experiencing

mild to severe anxiety as measured by HARS, Able to communicate effectively and follow instructions and Provided informed consent to participate. The Hamilton Anxiety Rating Scale (HARS) was used to assess anxiety levels. The instrument consists of 14 items evaluating both psychological and somatic symptoms of anxiety. Previous studies have demonstrated good psychometric properties of the Indonesian version of HARS, with satisfactory construct validity and internal consistency (Cronbach's $\alpha > 0.80$).

The instrument has been widely applied in studies involving elderly and clinical populations in Indonesia, supporting its suitability for the present study. Exclusion criteria included: Cognitive impairment or dementia, Unstable medical conditions and Participation in other psychological interventions during the study period. Ethical approval for this study was obtained from the institutional ethics committee of STIKES Telogorejo Semarang with number: 002/ III/ EC/ P3M/STIKES/2024. Written informed consent was collected from all participants after a full explanation of the study's purpose and procedures. Intervention Procedure, Participants received Mindfulness Butterfly Hug Therapy for three consecutive days, with each session lasting 15 minutes. To ensure intervention standardization, all participants received the same Mindfulness Butterfly Hug Therapy protocol. Each session lasted approximately 15 minutes and followed a structured sequence consisting of guided breathing exercises, mindfulness awareness, bilateral Butterfly Hug tapping, and positive affirmation exercises.

The intervention procedures were documented in a standardized protocol and delivered consistently across all sessions. The intervention was delivered by a registered nurse who had received prior training in mindfulness-based interventions and Butterfly Hug techniques. Before data collection, the facilitator participated in a protocol briefing session to ensure consistency in intervention delivery and participant guidance throughout the study period. Intervention fidelity was monitored using a session checklist completed after each intervention session. The checklist ensured that all key components of the therapy were delivered according to the established protocol. Participant adherence was monitored throughout the intervention period. All enrolled participants attended and completed the three scheduled therapy sessions, and no intervention-related adverse events were reported.

Measurement Tool: Anxiety levels were measured using the Hamilton Anxiety Rating Scale (HARS), a validated and widely used instrument to assess the severity of anxiety symptoms. The HARS consists of 14 items rated on a 5-point Likert scale (0–4), with higher scores indicating more severe anxiety. The instrument has been shown to have strong internal consistency and reliability in elderly populations. Data Analysis, Descriptive statistics were used to summarize participant characteristics and anxiety categories before and after the intervention. The paired t-test was used to analyze the difference in mean anxiety scores between pretest and posttest measurements. A p-value of less than 0.05 was considered statistically significant. All statistical analyses were performed using SPSS software version 26.0.

3. RESULTS AND DISCUSSION

Table 1. Pre-intervention anxiety levels (n = 97).

Anxiety Level	Frequency	Percentage (%)
Moderate	13	13.4
Severe	77	79.4
Panic	7	7.2
Total	97	100

Table 1 presents the levels of anxiety experienced by participants before the implementation of Mindfulness Butterfly Hug Therapy. The majority of respondents (79.4%) were classified as experiencing severe anxiety. The distribution of respondent characteristics indicates that the majority of participants were within the early elderly category, reflecting a population that is still relatively active but already experiencing physiological decline associated with aging. This demographic profile is important, as individuals in this age group are particularly vulnerable to both chronic diseases such as hypertension and psychosocial disturbances, including anxiety. The predominance of female participants also aligns with epidemiological trends showing higher life expectancy among women, which consequently increases their representation in elderly populations.

From an educational perspective, most respondents had a basic to moderate level of education. This factor may influence their understanding of health information and their ability to adopt non-pharmacological interventions such as mindfulness-based therapies. Lower educational attainment is often associated with limited health literacy, which can affect compliance with both pharmacological and non-pharmacological treatments. However, the successful implementation of the intervention in this study suggests that Mindfulness Butterfly Hug Therapy is sufficiently simple and adaptable, making it accessible even for individuals with limited educational backgrounds.

In terms of occupational status, a large proportion of respondents were no longer actively employed. This condition may contribute to increased psychological vulnerability, as reduced social interaction and decreased productivity can lead to feelings of isolation and anxiety. Additionally, the presence of hypertension among all participants confirms that the sample represents a high-risk group requiring comprehensive management that addresses both physical and psychological dimensions. Overall, these characteristics provide a contextual foundation for interpreting the effectiveness of the intervention, as they reflect a population that is both clinically relevant and socially representative of elderly individuals in community health settings.

Table 2. Post-intervention anxiety levels (n = 97).

Anxiety Level	Frequency	Percentage (%)
Moderate	11	11.3
Severe	85	87.6
Panic	1	1.1
Total	97	100

Table 2 shows the intervention, there was a marked improvement in anxiety levels. The majority of participants (87.6%) were classified as experiencing mild anxiety, and 11.3% reported no anxiety at all. Following the intervention, anxiety levels decreased substantially. Most participants were classified as having mild anxiety (87.6%), while 11.3% reported no anxiety symptoms. Only a small proportion of respondents remained in the moderate anxiety category. These findings indicate a favorable change in anxiety status following the implementation of Mindfulness Butterfly Hug Therapy. The pre-intervention data reveal that the majority of respondents experienced moderate to severe levels of anxiety, as indicated by the Hamilton Anxiety Rating Scale (HARS) scores. This finding underscores the significant psychological burden faced by elderly individuals with hypertension. Anxiety in this population is not merely a secondary condition but often interacts bidirectionally with hypertension, potentially exacerbating cardiovascular risk through mechanisms such as increased sympathetic nervous system activity, elevated blood pressure, and impaired sleep quality.

The high baseline anxiety levels may also reflect the cumulative impact of various

stressors commonly experienced by the elderly, including declining physical health, fear of complications, reduced independence, and limited social support. In addition, chronic illness management itself can be a source of psychological strain, particularly when individuals must adhere to long-term treatment regimens and lifestyle modifications. These factors collectively contribute to a heightened state of emotional distress prior to intervention.

Importantly, the pre-intervention findings highlight the urgent need for effective, accessible, and non-pharmacological strategies to manage anxiety in this population. Pharmacological treatments, while beneficial, may not always be ideal for elderly patients due to potential side effects, polypharmacy, and drug interactions. Therefore, the identification of high anxiety levels at baseline provides strong justification for the implementation of interventions such as Mindfulness Butterfly Hug Therapy, which aim to address psychological distress in a safe and holistic manner.

Table 3. Paired t-test of pre- and post-intervention anxiety scores.

Measurement	Mean	Mean Difference	95% CI		p-value
			Lower	Upper	
Pre-test	31.94	15.41	12.06	18.77	0.001
Post-test	16.53				

The significant p-value ($p = 0.001$) indicates that Mindfulness Butterfly Hug Therapy effectively reduced anxiety levels in hypertensive elderly individuals. The post-intervention results demonstrate a substantial reduction in anxiety levels among respondents, with a notable shift from severe and moderate anxiety categories to mild or no anxiety. This change indicates that the Mindfulness Butterfly Hug Therapy intervention was effective in alleviating psychological distress within a relatively short period. The decrease in mean HARS scores further supports the quantitative significance of this improvement, suggesting that the intervention produced not only categorical but also measurable clinical benefits.

The effectiveness of the therapy can be explained through its combined mechanisms of action. The Butterfly Hug technique involves bilateral stimulation, which is believed to facilitate emotional regulation and reduce the intensity of distressing thoughts. When integrated with mindfulness practices, the intervention encourages individuals to focus on the present moment, thereby reducing rumination and worry two key components of anxiety. This dual approach may enhance the activation of the parasympathetic nervous system, leading to a state of relaxation characterized by decreased heart rate, improved breathing patterns, and reduced muscle tension.

Another important aspect of the findings is the practicality of the intervention. The therapy was administered over a short duration three consecutive days with brief sessions yet it produced significant outcomes. This suggests that the intervention is not only effective but also feasible for implementation in community health settings, such as primary care centers. Its simplicity, low cost, and minimal requirement for specialized equipment make it particularly suitable for elderly populations, who may face barriers to accessing more complex therapeutic modalities.

In addition, the observed improvements may have broader implications for overall well-being. Reduced anxiety is likely to contribute to better adherence to hypertension management, improved sleep quality, and enhanced quality of life. Therefore, the post-intervention results do not merely indicate a reduction in anxiety symptoms but also point toward potential long-term benefits in both psychological and physical health domains. This reinforces the value of integrating non-pharmacological interventions into routine care

for elderly individuals with chronic conditions.

This study demonstrates that Mindfulness Butterfly Hug Therapy significantly reduces anxiety in elderly individuals with hypertension. The therapy, combining mindful breathing with bilateral tapping, appears to offer both physiological and emotional benefits (Harisa, 2023).

The pre-intervention data showed that most participants experienced severe anxiety, consistent with previous research indicating a high prevalence of anxiety in the elderly, particularly those with chronic illnesses (Laka, 2020). After three consecutive therapy sessions, a significant reduction in anxiety scores was observed, aligning with findings by (Lumintang, 2023), who reported similar reductions using Butterfly Hug and other relaxation techniques.

The therapeutic effect may stem from the neurobiological mechanism of bilateral stimulation, which helps stabilize emotional responses and reduce hyperarousal (Creswell, 2017; Tang et al., 2015), as seen in trauma-focused therapies. Additionally, incorporating deep breathing may activate the parasympathetic nervous system, promoting calm and reducing cortisol levels (Pristianto, 2022).

Several factors may have contributed to the success of the intervention: its simplicity, cultural acceptability, and ease of implementation without medical equipment. It also promotes a sense of self-control and empowerment among elderly individuals facing health uncertainty. These findings support the use of non-pharmacological, community-based interventions in managing mental health among older adults, especially those at risk of polypharmacy (Demarzo et al., 2015; Lenze, 2014). Consistent with previous studies (Girianto et al., 2021), the results highlight the importance of complementary therapies in improving psychological well-being.

Study Limitations, While the results are promising, this study had several limitations: The absence of a control group limits causal inference. The short duration (3 days) may not capture long-term effects. The study was conducted at a single site, which may limit generalizability. **Recommendations** Future research should include a randomized control group, longer intervention periods, and follow-up assessments to examine sustained effects. Integration into primary health care programs could also be explored for broader community application (Firmawati et al., 2025).

To further contextualize the findings, it is important to situate the effectiveness of Mindfulness Butterfly Hug Therapy within broader theoretical and clinical frameworks of anxiety management in elderly populations. The significant reduction in anxiety levels observed in this study reflects not only the immediate impact of the intervention but also its alignment with established mechanisms of mindfulness-based approaches. Mindfulness practices are widely recognized for their capacity to enhance emotional regulation, reduce cognitive reactivity, and promote adaptive coping strategies. In elderly individuals, these mechanisms are particularly relevant due to age-related vulnerabilities in both physiological and psychological domains.

From a neuropsychological perspective, the integration of mindfulness and bilateral stimulation, as employed in the Butterfly Hug technique, may contribute to the modulation of neural pathways associated with stress and emotional processing. The repetitive, rhythmic tapping involved in the intervention is believed to facilitate interhemispheric communication, thereby supporting the processing of distressing emotions and reducing their intensity. When combined with mindful awareness, this process may help individuals disengage from maladaptive thought patterns, such as excessive worry and rumination, which are central features of anxiety disorders. This dual mechanism offers a plausible explanation for the rapid and significant improvements observed in the study.

In addition, the findings of this study reinforce the growing body of evidence

supporting non-pharmacological interventions as viable and effective strategies for managing anxiety in elderly populations. Pharmacological treatments, while often necessary, may present challenges such as side effects, dependency risks, and interactions with other medications commonly used by older adults. In contrast, interventions like Mindfulness Butterfly Hug Therapy provide a safer and more accessible alternative that can be implemented with minimal resources. This is particularly important in primary healthcare settings, where limitations in infrastructure and workforce may restrict the availability of specialized mental health services.

Another critical dimension to consider is the role of cultural and social context in shaping the acceptability and effectiveness of the intervention. The simplicity and non-invasive nature of the Butterfly Hug technique make it adaptable to diverse community settings, including those with limited exposure to formal psychological therapies. Elderly individuals may be more receptive to interventions that are easy to understand, require no complex equipment, and can be practiced independently. This accessibility enhances the potential for sustained use beyond the structured intervention period, thereby supporting long-term mental health benefits.

Furthermore, the improvement in anxiety levels observed in this study may have indirect effects on the management of hypertension. Anxiety is known to influence cardiovascular functioning through mechanisms such as increased sympathetic activation and elevated blood pressure. By reducing anxiety, the intervention may contribute to better physiological regulation, improved adherence to treatment, and overall enhancement of health outcomes. Although this study did not directly measure changes in blood pressure, the psychological improvements identified suggest a promising avenue for integrated care approaches that address both mental and physical health.

Despite these positive findings, it is essential to acknowledge certain limitations that may inform future research. The use of a one-group pretest–posttest design, while appropriate for preliminary investigation, does not allow for causal inference with the same level of confidence as randomized controlled trials. The absence of a control group means that external factors cannot be entirely ruled out as contributing to the observed changes. Additionally, the relatively short duration of the intervention limits the ability to assess long-term effects and sustainability. Future studies should consider incorporating control groups, longer follow-up periods, and larger, more diverse samples to strengthen the evidence base.

In terms of practical implications, the results of this study suggest that Mindfulness Butterfly Hug Therapy can be integrated into community nursing and primary healthcare services as part of a holistic approach to elderly care. Healthcare providers can be trained to deliver the intervention with relative ease, and patients can be encouraged to practice the technique independently as a form of self-care. This aligns with contemporary healthcare paradigms that emphasize patient empowerment, preventive care, and the integration of mental health into general health services.

Finally, this study contributes to the broader discourse on the future of mental health interventions in aging populations. As the global population continues to age, there is an increasing need for scalable, cost-effective, and culturally adaptable strategies to address the complex interplay between chronic physical conditions and psychological well-being. Mindfulness Butterfly Hug Therapy represents one such strategy, offering a practical solution that bridges clinical effectiveness and real-world applicability. The findings presented here provide a foundation for further exploration and development of similar interventions, ultimately supporting the goal of improving quality of life among elderly individuals.

4. CONCLUSION

This study found a significant reduction in anxiety levels among hypertensive elderly individuals following participation in Mindfulness Butterfly Hug Therapy. The findings suggest that this mindfulness-based intervention may be associated with improvements in psychological well-being and may represent a practical, low-cost, and accessible non-pharmacological approach for use in community healthcare settings. However, because the study employed a one-group pretest-posttest design without a control group, causal conclusions cannot be established. Therefore, the results should be interpreted as preliminary evidence that warrants further investigation. Future research should employ more rigorous methodological designs, particularly randomized controlled trials, to strengthen causal inference. Longer follow-up periods are also needed to determine the sustainability of intervention effects over time. In addition, future studies should incorporate objective physiological outcomes, such as systolic and diastolic blood pressure measurements, heart rate, and other indicators of cardiovascular health, to better understand the potential psychological and physiological benefits of Mindfulness Butterfly Hug Therapy among elderly individuals with hypertension.

REFERENCE

- Celano, C. M., Daunis, D. J., Lokko, H. N., Campbell, K. A., & Huffman, J. C. (2016). Anxiety Disorders and Cardiovascular Disease. *Current psychiatry reports*, 18(11), 101. <https://doi.org/10.1007/s11920-016-0739-5>
- Creswell, J. D. (2017). Mindfulness interventions. *Annual Review of Psychology*, 68, 491–516. <https://doi.org/10.1146/annurev-psych-042716-051139>
- Demarzo, M. M. P., Montero-Marin, J., Puebla-Guedea, M., Navarro-Gil, M., Herrera-Mercadal, P., Moreno-González, S., & García-Campayo, J. (2015). Efficacy of mindfulness-based interventions in primary care. *BMC Family Practice*, 16, 14. <https://doi.org/10.1186/s12875-015-0233-1>
- Firmawati, F., Biahimo, N.U.I., & Kau, M. (2025). Efektivitas pemberian terapi Butterfly Hug dan aromaterapi lavender. *Jurnal Keperawatan Muhammadiyah*, 10(1), 16-25. <https://doi.org/10.30651/jkm.v10i1.25079>
- Girianto, P. W. R., Widayati, D., & Agusti, S. S. (2021). Butterfly Hug reduce anxiety on elderly. *Jurnal Ners dan Kebidanan*, 8(3), 295–300. <https://doi.org/10.26699/jnk.v8i3.ART.p295-300>
- Goyal, M., Singh, S., & Sibinga, E. M. (2014). Meditation programs for psychological stress and well-being. *JAMA Internal Medicine*, 174(3), 357–368. <https://doi.org/10.1001/jamainternmed.2013.13018>
- Harisa, A. (2023). Edukasi terapi Butterfly Hug untuk menurunkan ansietas. *Jurnal Abdimas Kesehatan (JAK)*, 5(3), 604-610. Retrieved from <https://jak.ubr.ac.id/index.php/jak/article/view/603>
- Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression. *Journal of Consulting and Clinical Psychology*, 78(2), 169–183. <https://doi.org/10.1037/a0018555>
- Juwariyah, S. (2025). Cognitive disorders and elderly health. *Journal of Elderly Health*, 7(4), 367–372. Retrieved from <https://jurnal.globalhealthsciencegroup.com/index.php/IJGHR/article/view/6133>
- Khoury, B., Sharma, M., Rush, S. E., & Fournier, C. (2015). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review*, 33(6), 763–771. <https://doi.org/10.1016/j.cpr.2013.05.005>
- Laka, O. K. (2020). Hubungan hipertensi dengan tingkat kecemasan pada lansia. *Nursing News*, 3(1), 22–32.

- Lenze, E. J. (2014). Mindfulness-based stress reduction for older adults. *Depression and Anxiety*, 31(9), 786–794. <https://doi.org/10.1002/da.22273>
- Lumintang, Y. F. (2023). Gambaran aspek psikologis pada pasien hipertensi. *Caring Nursing Science Journal*, 1(1), 64–72.
- Maryuni, S. (2020). Hubungan faktor stres psikososial dengan hipertensi. *Jurnal Ilmu Keperawatan Indonesia*, 1(1), 1–9.
- Pristianto, A. (2022). Deep breathing dan Butterfly Hug. *Jurnal Penelitian Dan Pengabdian*, 3(1), 36–46.
- Ramdhani, Z. D., & Soleman, S. R. (2023). Penerapan teknik butterfly hug untuk menurunkan kecemasan pada lansia di panti usia lanjut 'Aisyiyah Surakarta. *Jurnal Ilmu Kedokteran dan Kesehatan Indonesia*, 3(3), 186-193. <https://doi.org/10.55606/jikki.v3i3.2173>
- Raniasmi, P. I. (2023). *Profil Kesehatan Kota Semarang*. Semarang: Dinas Kesehatan Kota Semarang.
- Satapathy, P., Gaidhane, A. M., Vadia, N., Menon, S. V., Chennakesavulu, K., Panigrahi, R., Bushi, G., Singh, M., Sah, S., Turkar, A., Rao, S. G., Goh, K. W., Shabil, M., & Mawejje, E. (2025). Between Depression and Risk of Hypertension: A Systematic Review and Meta-Analysis. *Brain and behavior*, 15(9), e70931. <https://doi.org/10.1002/brb3.70931>
- Sumartha, A. R. (2024). *Efektivitas Butterfly Hug untuk menurunkan tingkat kecemasan mahasiswa Ma'had Sunan Ampel Al-'Aly Universitas Islam Negeri Maulana Malik Ibrahim Malang*. Undergraduate thesis, Universitas Islam Negeri Maulana Malik Ibrahim.
- Tang, Y. Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience*, 16, 213–225. <https://doi.org/10.1038/nrn3916>