



Original Article

Butterfly hug therapy on reducing anxiety levels and stabilization hemodynamics in patient digital subtraction angiography

Anis Wiji Astuti¹, Fahrur Nur Rosyid^{1✉}, Sumarno Adi Subrata¹

¹ Master of Nursing Study Programme, Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, Central Java, Indonesia

ARTICLE INFORMATION

Received: March 23, 2024
Revised: April 22, 2024
Accepted: April 25, 2024

KEYWORDS

Butterfly Hug Therapy; Digital Subtraction Angiography; Anxiety; Heart Rate; Blood Pressure

CORRESPONDENCE

Phone: +62 8123183523
E-mail: fnr100@ums.ac.id

A B S T R A C T

Background: Digital subtraction angiography can affect anxiety in patients so that it can worsen the patient's condition during catheterization, such as increased heart rate and breathing. One of the efforts to reduce anxiety that can improve hemodynamics is butterfly hug therapy. However, its effectiveness in reducing hemodynamic anxiety needs to be further investigated.

Purpose: To evaluate butterfly hug therapy's effectiveness on anxiety and hemodynamics before digital subtraction angiography.

Methods: This is a quasi-experiment study with a pretest-posttest control group design. Fifty-two respondents were selected using purposive sampling. A total of 26 respondents were given butterfly hug therapy, and 26 others were given standard therapy. The study implemented the Zung Self Rating Anxiety Scale Questionnaire and observation sheet. This research analysis uses the Independent T-test and Wilcoxon Test.

Results: The anxiety level of the experimental group was lower than that of the control group (46.73 ± 2.08 vs. 53.84 ± 1.74 ; $p < 0.05$). In hemodynamic stability (pulse, respiratory, and blood pressure) was stability than the control group (80.69 ± 2.44 vs. 89.11 ± 2.39 ; 20.65 ± 0.39 vs. 21.0 ± 0.53 ; 104.7 ± 1.46 vs. 109.5 ± 1.82 ; $p < 0.05$).

Conclusion: Butterfly hug therapy is effective in reducing anxiety and stabilizing hemodynamics among patients undergoing digital subtraction angiography.

INTRODUCTION

Digital subtraction angiography (DSA) is an invasive diagnostic catheterization procedure that remains the gold standard imaging modality for cerebrovascular disorders.¹ The method aims to investigate the abnormalities in blood vessels in both extra and intracranial areas, for example, transient ischemic attack (TIA), recurrent ischemic stroke, spontaneous subarachnoid hemorrhage, aneurysm, arterial-venous malformation, intracranial vasospasm, tumors located in the head area, dural arteriovenous and carotid-cavernous fistulas, and other conditions to see the anatomical shape or collaterals that exist in both extra and intracranial blood vessels.² This procedure is used to locate abnormal brain or spinal blood vessels (such as aneurysms, venous, arterial malformations, and stenosis) and determine blood flow with vascular conditions (such as vasospasm, vasculitis, and brain tumor vascularization).³ Even though this procedure promises effective outcomes,

several complications such as cerebral infarction, contrast-induced allergy, and angio-site hematoma or infection can occur after DSA.⁴

Previous research found the impact of DSA actions, such as hemodynamic changes, shortness of breath, pain, fatigue, and anxiety. When left untreated, the condition may affect hemodynamic function, leading to tachycardia, hypertension, and breathing issues. In addition, the changes in hemodynamic activities lead to the syndrome of headache, nausea and vomiting, blurred vision, dizziness, heart palpitations, and seizures. Anxiety, if left unchecked, will affect the patient's hemodynamic condition, and the physiological impact of anxiety can lead to complications such as increased heart rate, blood pressure, and breathing frequency. Disturbed hemodynamics can lead to complications, one of which is dialysis disequilibrium syndrome, which is a syndrome of headache, nausea and vomiting, blurred vision, dizziness, heart palpitations, and seizures.

<https://doi.org/10.30595/medisains.v22i1.21484>

©(2024) by the Medisains Journal. Readers may use this article as long as the work is properly cited, the use is educational and not for profit, and the work is not altered. More information is available at [Attribution-NonCommercial 4.0 International](https://creativecommons.org/licenses/by-nc/4.0/).

If the hemodynamics are disturbed, the action cannot be taken.⁵ Previous research found that pre-catheterization anxiety was experienced by 70-75% of patients. The anxiety of cardiac catheterization patients continues to increase from the day before the auction, 2 hours before the auction, and 1.5 hours before the auction until the highest level of anxiety is observed 30 minutes before cardiac catheterization, and anxiety decreases slightly after cardiac catheterization.⁶

Treatments for anxiety can be non-pharmacological and pharmacological. Non-pharmacological therapies because these interventions are more accessible, cheaper, safer, and more enjoyable, including progressive and autogenic muscle relaxation, music therapy, butterfly hugs, guided imagery, virtual reality, deep breath relaxation, and mindfulness training.⁷⁻¹⁰ The Butterfly Hug method can be done in various places as long as it is safe, comfortable, and not too crowded. However, this technique cannot replace pharmacological therapy. Butterfly hug therapy only serves to relieve feelings of anxiety and provide a temporary calming effect. Several studies have found that butterfly hug therapy reduces anxiety, can provide a sense of security and comfort, and can increase concentration so that it helps individuals feel calm. However, previous studies have only examined it in elderly patients, so no research has examined it to stabilize hemodynamics in DSA patients.⁸ This study aims to determine the effectiveness of butterfly hub therapy in reducing anxiety levels and stabilizing patient hemodynamics during digital subtraction angiography.

METHOD

Study Design

This is a quasi-experiment study with a pretest-posttest control group design.¹¹

Setting and Respondents

This study was conducted at Indriati Solo Baru Hospital in January 2024. The population in this study was all patients undergoing DSA. The sample in this study was 52, divided into two groups (the Intervention group and the control group) randomly.¹² Inclusion criteria are age over 18 years, being able to communicate, and being willing to be part of this study. Meanwhile, the exclusion criteria were patients with poor general conditions (shortness of breath, palpitations, and fatigue).

Variables, Instruments, and Measurements

The study used several variables, including anxiety levels and hemodynamic stability (pulse, respiratory, and blood pressure). The instrument used to measure anxiety levels was the Zung Self-rating Anxiety Scale (ZSAS). The instrument consists of 20 questions with interpretation of the results of scores < 45 in the normal range, scores 45-59 mild

anxiety, scores 60-74 moderate anxiety and scores > 75 severe anxiety, with a Likert scale of 1 to 4.¹³ Meanwhile, hemodynamic stability uses an observation sheet instrument consisting of mean arterial pressure, pulse, and respiration rate.

Experimental Procedure

The intervention group received butterfly hug therapy for 10 to 15 minutes twice a day, 2 hours before the action and 30 minutes before the action. The control group received deep breath therapy for 10 to 15 minutes twice a day, 2 hours before the action and 30 minutes before the action.

Statistical Analysis

An independent T-test and Wilcoxon Test was used to determine differences in anxiety and hemodynamics between groups in this study.

Ethical Consideration

This research obtained ethical clearance from the Health Research Ethics Commission (KEPK) FK UMS with number 5140/B.1/KEPK-FKUMS/XI/2023.

RESULTS

Most of the characteristics of the respondents in this study were female, with an average age of 44.92. Most patients presented with a medical diagnosis of Ischemic stroke (Table 1). Table 2 shows that the mean level of anxiety in the experimental group and the control group decreased. However, the mean decrease was more significant in the experimental group. The pulse rate indicators of the experimental group were more stable than those in the control group, while the respiratory and blood pressure indicators were relatively the same.

The analysis showed significant differences in anxiety levels and hemodynamic stability between the intervention group and the control group. The anxiety level of respondents who were given butterfly hug therapy was lower than the control group ($p < 0.05$), as well as the hemodynamic stability of respondents who were given butterfly hug therapy was stability than the control group ($p < 0.05$) (Table 3).

Table 1. Characteristics of Respondents (n=52)

Characteristic	Result
Gender	
Female	32 (61.5%)
Male	20 (38.5%)
Age, yrs	44.92 ± 1.77
Medical Diagnosis	
Ischemic stroke	23 (44.2%)
CVST	17 (32.7%)
Cephalgia	12 (23.1%)

CVST: Cerebral Venous Sinus Thrombosis

Table 2. Anxiety and Hemodynamic Before and After Intervention

Variable	Experimental Group		Mean diff	Control Group		Mean diff
	Pretest	Posttest		Pretest	Posttest	
	Mean ± SD	Mean ± SD		Mean ± SD	Mean ± SD	
Anxiety Level	63.46 ± 8.97	46.72 ± 8.90	16.73	64.54 ± 6.42	52.23 ± 11.25	12.31
Hemodynamic						
Pulse	92.15 ± 12.93	80.69 ± 12.47	11.46	69.54 ± 9.07	89.96 ± 12.75	-20.42
Breathing	21.69 ± 2.09	19.96 ± 2.34	1.73	21.31 ± 2.20	19.96 ± 2.18	1.35
Blood pressure	114.997 ± 7.79	104.700 ± 7.47	10.30	118.154 ± 8.26	109.55 ± 9.29	8.60

Table 3. Analyze Differences in Anxiety and Hemodynamics Between Groups

Variable	Experimental Group	Control Group	p-value
Anxiety Level	46.73±1.74	53.84±2.08	0.012
Hemodynamic			
Pulse	80.69±2.44	89.11±2.39	0.017
Breathing	20.65±0.39	21.0±0.53	0.04
Blood pressure	104.7±1.46	109.5±1.82	0.05*

*Wilcoxon Test

DISCUSSION

This study found that providing butterfly hug therapy could reduce anxiety levels and stabilize hemodynamics ($p < 0.05$). Anxiety is a stressor that can cause a stress response. When the amygdala releases a stressor, the hypothalamus will activate the sympathetic nervous system, triggering the release of vasopressin and increasing CRH-ACTH-cortisol secretion. Sympathetic stimulation will stimulate the adrenal medulla to release catecholamines as epinephrine. Vasoconstriction of renal afferent arterioles by catecholamines indirectly triggers renin secretion by reducing blood flow to the kidneys, resulting in RAAS. An increase in renin will convert angiotensinogen from the liver into angiotensin I, and with the help of ACE, angiotensin I will be converted into angiotensin II. Vasopressin and angiotensin II will cause vasoconstriction of blood vessels, thereby increasing blood pressure.^{14,15}

Providing butterfly hug therapy can reduce anxiety levels by influencing the amygdala, which contains catecholamines with two chemical reactions, namely adrenaline and noradrenaline, to reduce anxiety.¹⁶ The results of this study are in line with the results of previous research. After receiving three treatment sessions for one week, there was a change in anxiety levels.⁸ The results of this study also support previous research, which found that butterfly hug therapy was effective in reducing anxiety so that it could increase self-confidence and appreciation in thanking oneself for being able to face many things in all life processes.¹⁴ Providing butterfly hug therapy can also increase positive feelings and self-confidence in chronic kidney disease patients with problems of helplessness.¹⁵

Other research states that the butterfly hug technique is suitable for use in pre-DIA. Patients showed a positive effect on hemodynamic status. Giving the butterfly hug technique for meditation helps to have a relaxing effect on the

body.¹⁶ This is because the butterfly hug technique focuses on the beats' sound, rhythm, and rhythm and applies positive affirmation techniques in the middle of the meditation. Individuals will remain focused on the beats produced and the sounds or whispered affirmations made to increase their positive outlook and reflect their self-esteem. It can improve brain function, such as the medial prefrontal cortex and posterior cingulate cortex, ventral striatum, and ventral medial prefrontal cortex, which act as parts of the brain for viewing views, perception, judgment, and emotional regulation, thereby reducing stress.¹⁷

CONCLUSIONS AND RECOMMENDATION

The study found that butterfly hugs help reduce anxiety and maintain stable hemodynamic levels in individuals with DIA. Clinical nurses can employ this therapeutic approach to assist patients in coping with psychological disorders prior to undergoing surgery. Additional research is required to assess the supplementary effects of butterfly hugs in various surgical procedures.

REFERENCES

1. Bashir Q, Ishfaq A, Baig AA. Safety of Diagnostic Cerebral and Spinal Digital Subtraction Angiography in a Developing Country: A Single-Center Experience. *Interv Neurol.* 2018;7(1-2):99-109. doi:10.1159/000481785
2. Subandi S, Budiarto P, Putra SE, Randa WG. Komplikasi Neurologis dan Non-Neurologis Prosedur Digital Subtraction Angiography Serebral di RSUD Dr. Moewardi Periode Juni 2013-Mei 2018. *Smart Med J.* 2020;3(1):20. doi:10.13057/smj.v3i1.38356
3. Utomo TY. Serebral Dan Spinal Digital Subtraction Angiography. *J Kedokt Univ Palangka Raya.* 2021;9(1):1232-1242. doi:10.37304/jkupr.v9i1.2862

4. Nam HH, Jang DK, Cho BR. Complications and risk factors after digital subtraction angiography: 1-year single-center study. *J Cerebrovasc Endovasc Neurosurg.* 2022;24(4):335-340. doi:10.7461/jcen.2022.E2022.05.001
5. Inawijaya D, Haq RK, Sari IM. Penerapan Teknik Alternate Nostril Breathing Exercise Terhadap Tekanan Darah dan Frekuensi Nafas Pada Pasien CHF di RSUD Dr Moewardi Surakarta. *J Excell.* 2023;2(2):1-10. <https://journal.universitaspahlawan.ac.id/index.php/excellent/article/view/21948>
6. Ziyaeifard M, Zahedmehar A, Ferasatkish R, et al. Effects of lavender oil inhalation on anxiety and pain in patients undergoing coronary angiography. *Iran Hear J.* 2017;18(1):44-50. http://journal.iha.org.ir/article_82758.html
7. Hermanto A, Sukartini T, Esti Y. Terapi Non Farmakologis untuk Mengurangi Kecemasan pada Pasien Kanker dengan Kemoterapi: A Systematic Review. *J Penelit Kesehat Suara Forikes.* 2020;11(6):334-337. <https://forikes-ejournal.com/index.php/SF/article/view/sf11401/0>
8. Girianto PWR, Widayati D, Agusti SS. Butterfly Hug Reduce Anxiety on Elderly. *J Ners dan Kebidanan (Journal Ners Midwifery).* 2021;8(3):295-300. doi:10.26699/jnk.v8i3.art.p295-300
9. Laili F, Wartini E. Pengaruh Teknik Relaksasi Nafas Dalam Terhadap Kecemasan Dalam Menghadapi Persalinan pada Ibu Hamil. *J Kebidanan.* 2017;3(3):152-156. <https://ejournalmalahayati.ac.id/index.php/kebidanan/article/view/621>
10. Safitri W, Agustin WR. Terapi Guide Imagery Terhadap Penurunan Kecemasan Pasien Preoperasi Sectio Caesarea. *J Keperawatan Aisyiyah.* 2020;7(1):31-37. <https://journal.unisa-bandung.ac.id/index.php/jka/article/view/163>
11. Sastroasmoro S. *Dasar Dasar Metodologi Penelitian Klinis Sudigdo Sastroasmoro.*; 2008.
12. Sugiyono. *Metode Penelitian Kuantitatif, Kualitatif, Dan R&D.* 1st ed. Penerbit Alfabeta; 2019.
13. Nulinawati, Rudini D, Yuliana. Hubungan Tingkat Kecemasan Dengan Hemodinamik Pasien Gagal Ginjal Kronik Yang Menjalani Hemodialisa. *J Ilm Ilmu Terap Univ Jambi.* 2019;3(1):28-40. <https://online-journal.unja.ac.id/JKAM/article/view/8464>
14. Kadri F, Ridfah A, Ismail I. Butterfly Hug Untuk Mengurangi Stres Akademik Pada Mahasiswa Psikologi. *J Correct Issue.* 2022;6(1). <https://journal.poltekip.ac.id/jci/article/view/358>
15. Mar'atussolikha AMU, Amalia RF, Pratama KN. Pengaruh Penerapan Teknik Butterfly Hug dan Promosi Koping Pada Pasien Gagal Ginjal Kronik dengan Masalah Ketidakberdayaan. *Journal of Bionnursing.* 2024;1(1):103-114. <http://bionnursing.fikes.unsoed.ac.id/bion/index.php/bionnursing/article/view/272>
16. Pristianto A, Tyas RH, Muflikha I, Ningsih AF, Vanath IL, Reyhana FN. Deep Breathing dan Butterfly Hug: Teknik Mengatasi Kecemasan Pada Siswa MAN 2 Surakarta. *Kontribusi J Penelit dan Pengabd Kpd Masy.* 2022;3(1):36-46. doi:10.53624/kontribusi.v3i1.127
17. Caturini E, Safitri ND, Sugi S. The Effectiveness of Butterfly Hug in Reducing Anxiety Long-Distance Relationship (LDR) with Parents in Nursing Students. *Basic Appl Nurs Res J.* 2023;4(1):9-19. doi:10.11594/banrj.04.01.02