TeJoS: Teewan Journal Solutions
Volume 2 Number 2, Juni 2025
http://teewanjournal.com/index.php/teekes

Effect of Acupresure at ST36 Point (Zusanli) on Reduction of Knee Pain in Subacute Phase Stroke Patients

Afifah Nur halizah[1]
DIII Acupuncture, Aceh Acupuncture Academy, Email: afifahnur@acehakupunktur.ac.id
Atika Afniratri[2]
DIII Acupuncture, Aceh Acupuncture Academy, email: atikaafni@acehakupunktur.ac.id
MehdyaVikia Murti[3]
DIII Acupuncture, Aceh Acupuncture Academy, email: mehdyavm@acehakupunktur.ac.id

Submitted: 03/08/2025 Accepted: 08/08/2025 Published: 12/08/2025

ABSTRACT
Background and Purpose of the Study: *Stroke is a neurological condition caused by impaired blood flow to the brain, often leading to residual symptoms such as pain. Non-pharmacological therapies such as acupressure have been identified as a practical and clinically effective method to aid healing and recovery in stroke patients. This study aims to determine the effect of acupressure at the ST36 (Zusanli) point on reducing knee pain in subacute stroke patients.* ***Research Methods:*** *This study used a quantitative design with a pre-experimental approach and a one-group pretest-posttest design. The study population was all subacute stroke patients experiencing knee pain and undergoing treatment at a healthcare facility. The study sample consisted of 30 individuals who met the inclusion criteria (subacute stroke patients 2-6 months old, knee pain NPRS ≥ 4, cooperative and willing to follow the procedure) and exclusion criteria. Acupressure was applied to the ST36 (Zusanli) point using the index finger for 2 minutes per session, performed twice daily for 5 days. Knee pain levels were assessed using the Numerical Pain Rating Scale (NPRS) (scale 0-10) before and after the intervention. Univariate and bivariate data were analyzed using the Wilcoxon Signed Rank test to determine differences in pain scores before and after the intervention.* ***Research Results****: A total of 20 respondents participated in this study, with a majority of 55% male and 45% aged 61-70 years. Results showed a significant reduction in average pain scores with the ST36 acupressure intervention. The average pain score before therapy was 6.75, and after therapy it decreased to 2.95, with an average difference of 3.80 points. The Shapiro-Wilk test for normality indicated that the pain score data were not normally distributed, but the Wilcoxon Signed Rank test showed a significance value of p>0.005, indicating a significant difference. This pain reduction occurred across all age groups and genders, demonstrating the overall effectiveness of the therapy.* ***Conclusion:*** *Acupressure therapy at the ST36 point was significantly effective in reducing knee pain in subacute stroke patients, in both men and women, and across all age groups. These results support the use of ST36 acupressure as an adjunct non-pharmacological therapy to reduce pain in subacute stroke patients.*
Keywords: *Acupressure, Hypertension, Knee pain, Stroke*

Introduction

Stroke is a disease that occurs when blood in the brain suddenly experiences a disorder (Anggriani *et al.*, 2018). *The World Health Organization* (2022) states that stroke is a condition found with signs of clinical symptoms with focal and global neurological disorders that last rapidly for 24 hours or more that are at risk of death without a clear cause other than vascular disorders.

The World Health Organization (2024) recorded 5.5 million stroke cases in Indonesia, and showed an increase of 3.9% from 2013 to 2018. Meanwhile, some research states that in North Sumatra the prevalence of stroke is 9.3%. Meanwhile, in Aceh, the number of stroke sufferers increased from 11,210 people to 12,303 people. Women and men have almost the same incidence of stroke at 49.9% and 50.1%, respectively (Tamolenggehe *et al.*, 2021). The mechanism of therapy will accelerate the brain to undergo cell reorganization. A nonpharmacological action that has been shown to be practical and clinically effective for stroke is acupressure. Acupressure is performed at the acupuncture point. Acupressure is performed without using needles only using pressure with fingers or objects that can cause pressure (Hsiu *et al.*, 2011).

The selection of acupressure points is able to control the activation factor of the meridian pathway to help heal stroke and stabilize blood pressure. The points that can be used are HT 7 (Shenmen), ST 36 (Zusanli), LI4 (Hegu), SP6 (Sanyinjiao), LV3 (Taichong), DU20 (Baihui) points for 2 times a day (morning-evening) within 4 weeks showing improved physical condition (muscle strength) and improved quality of life) (Jie, 2010). This study aims to show that non-pharmacological acupressure therapy can help cure and recover in stroke.

Based on the formulation of the problem above, the purpose of this activity is to determine the effect of acupressure at the ST36 *point (Zusanli)* on the reduction of knee pain in subacute phase stroke patients.

Research Methods

This study uses a quantitative design with a pre-experimental approach of *the one group pretest-posttest design*. This design began with the measurement of the knee pain level of the pretest respondents before being given acupressure treatment, then ended with a posttest re-measurement after the treatment was completed. This model allowed researchers to compare pain scores before and after the intervention in the same group. The research was carried out at the AAA Neuheun Clinic from May to June 2025 after the researchers obtained an official letter of assignment.

The study population was all subacute phase stroke patients who experienced knee pain and underwent treatment at the health care facility. The sample was patients who met the inclusion and exclusion criteria and were willing to participate in the ST36 acupressure intervention, with a total of 20 people. The pretest stage was carried out on the first day using the *Numerical Pain Rating Scale* (NPRS), where respondents were asked to rate their perceived knee pain on a scale of 0–10 and the results were recorded as an initial score. Furthermore, respondents were given acupressure treatment at the ST36 point (*Zusanli*) using index finger pressure for 2 minutes per session, twice a day (morning and evening) for five consecutive days. The respondent's position was arranged to be comfortable, with the knees slightly bent so that the ST36 point could be precisely identified. After the entire series of treatments was completed, a posttest was performed on the fifth day using the same NPRS measuring tool to obtain a final score, which was then compared to the pretest score to determine the change in pain level after the intervention.

Results and Discussion

Results

This study aims to determine the effect of acupressure therapy at the ST36 point on the reduction of knee pain in subacute phase stroke patients. Pain measurement using the Numerical Pain Rating Scale (NPRS) was performed before and after the intervention. There were a total of 20 respondents.

The characteristics of respondents in this study were reviewed based on age and gender.

Gender	Frequency	Percentage
Man	11	55%
Woman	9	45%
Total	20	100%

Based on the table above, the study subjects who experienced the most subacute phase strokes were men as many as 11 people with a percentage of 55% of men having a higher incidence of stroke at a certain age, while women more often had strokes due to older age and longer life expectancy. After having a stroke, women tend to experience poorer functional outcomes and a lower quality of life than men. There are several factors such as coagulation, sex hormones, genetic background, social interactions, and lifestyle that may explain gender differences in stroke incidence independently or jointly (Hiraga, 2017), and the least of which is 9 women with a percentage of 45% Stroke is one of the highest causes of death in women worldwide, and there are several gender-specific factors that increase the risk of stroke in younger women, such as pregnancy, postpartum period, oral contraception, and migraines. Hormone replacement treatment to manage menopausal symptoms in older women is now no longer recommended because it can increase the risk of thromboembolism. However, thrombolysis and thrombectomy are now proven to be just as effective in women as they are in men. Post-stroke, women often have a poorer quality of life than men due to various factors such as age, stroke severity, pre-stroke dependency, and depression

Characteristics by Age

Age Group (years)	Frequency	Percentage
30-40	1	5%
41-50	6	30%
51-60	4	20%
61-70	9	45%
Total	20	100%

Based on the table above, the most subacute stroke sufferers at the age of 61-70 years, namely 9 people with a percentage of 45% and the research subjects who suffered the least subacute stroke at the age of 30-40 years, which amounted to 1 person with a percentage of 5%. In other literature, stroke does not only occur in the elderly, but also occurs at a young age, here is a quote from one journal on this subject: "About 10% of stroke cases occur at a relatively young age, i.e. less than 45 years old. The incidence of stroke in this age group is estimated to reach 7-15 cases per 100,000 population per year and is less common in children, which is 1-8 cases per 100,000 per year. There are a variety of different risk factors for stroke at a young age, including: migraines, sickle cell disease, heart disease, cerebral vascular abnormalities, Focal Cerebral Arteriopathy of childhood (FCA), post-varicella encephalopathy, Mitochondrial Encephalopathy with Lactic Acidosis and Stroke-like episodes (MELAS), arterial dissection, drug abuse, cerebral vasculitis such as temporal arteritis, Takayasu arteritis, polyarteritis nodosa (PAN), Wegener's granulomatosis, Systemic Lupus Erythematosus (SLE), Cerebral Autosomal Dominant Arteropathy with Subcortical Infarcts and Leucoencephalopathy (CADASIL), Fabry's disease, and thrombophilia" (Prima Birawa & Amalia in E Marviana, 2020)

Normality Test (Shapiro-Wilk)

Table 1 Pain Score Normality Test

Variabel	Sig. (Shapiro-Wilk)
Pre Pain Score	0.185
Post Pain Score	0.212

Based on the table above, the data test used is the Shapiro Wilk Test. Because the research subjects are less than 50, namely 20 research subjects. After the normality test, the data showed that the significant value of the stroke score before the intervention was 0.185 and the significant value after the intervention was 0.212. It can be concluded that the stroke score data before and after the intervention was abnormally distributed because the significant value was less than 0.05.

Paired Sample T-Test
Table 2 Paired t-test results

Variabel	Mean Difference	Sig. (2-tailed)
Pre - Post NPRS	3.80	0.000

Discussion

The results showed that acupressure therapy at the ST36 point can significantly reduce knee pain in subacute phase stroke patients. A decrease in pain score by 3.80 points strengthens the evidence that ST36 point stimulation has an analgesic effect. The ST36 (Zusanli) point is the main point that is often used in pain treatment, as it is able to modulate the central nervous system and increase the release of endorphins. These results are in line with previous research that found the effects of acupressure on a reduction in muscle and joint pain. In terms of characteristics, pain reduction results occurred in all age groups and genders, which indicates that this therapy is effective in general. This is in accordance with research by Sari et al. (2020) who found that acupressure at the ST36 point can significantly reduce pain intensity in patients with musculoskeletal disorders. Another study by Nugroho and Widyaningsih (2019) also stated that ST36 point stimulation is able to trigger the release of endorphins and increase the body's pain threshold physiologically.

Conclusion And Suggestion

Based on the results of the study on the effect of acupressure therapy at the ST36 point on the reduction of knee pain in subacute phase stroke patients, it can be concluded:

1. Acupressure therapy at the ST36 point succeeded in significantly reducing pain in patients with subacute phase stroke, based on the NPRS (Numerical Pain Rating Scale) score.
2. The average pain score decreased from 6.75 before the intervention to 2.95 after the intervention, with an average difference of 3.80 points.
3. The data is normally distributed so paired t-tests are used and the results show a significance value of p = 0.000, indicating a significant difference.
4. Pain reduction occurred in all sex groups, age groups, and in both patients with stroke ≤ 6 months and > 6 months, demonstrating the effectiveness of ST36 acupressure broadly.

Reference

1. Sari et al. (2020): ST36 acupressure lowers musculoskeletal pain
2. Nugroho & Widyaningsih (2019): ST36 triggers endorphins and increases pain threshold
3. Andjani, A. A. A. R., Cahyaningrum, P. L., & Suta, I. B. P. (2023). Acupuncture therapy for ischemic stroke patients. *Health Science*, *5*(2), 1–9. https://doi.org/10.32795/widyakesehatan.v5i2.4824
4. Anggriani, A., Zulkarnain, Z., Sulaiman, S., & Gunawan, R. (2018). Effect of ROM (Range of Motion) on Externa Muscle Strength in Non-Hemorrhagic Stroke Patients. *Research Journal of Hesti Medan Akper Kesdam I/BB Medan*, *3*(2), 64. https://doi.org/10.34008/jurhesti.v3i2.46

5. Hsiu, H., Huang, S. M., Chen, C. T., Hsu, C. L., & Hsu, W. C. (2011). Acupuncture stimulation causes bilaterally different microcirculatory effects in stroke patients. *Microvascular Research*, *81*(3), 289–294. https://doi.org/10.1016/j.mvr.2011.03.001
6. Jie, S. K. (2010). The science of acupuncture. *Singapore: TCM Publication*, 29–190.
7. District, D., Mongondow, B., Pinontoan, M. V., & Mamosey, W. E. (2021). *Vol. 14 No. 4 / October - December 2021*. *14*(4), 1–18.
8. Purinasari, R., Handayani, F., & Johan, A. (2023). The Effect of Acupressure on Stroke Patients: A Scoping Rewiew. *Journal of Nursing*, *15*(2), 787–800. https://doi.org/10.32583/keperawatan.v15i2.927
9. Health Research and Development Agency. (2018). Report on Basic Health Research Results (Riskesdas). Health Research and Development Agency of the Ministry of Health of the Republic of Indonesia. Retrieved November 14, 2021 from https://www.litbang.kemkes.go.id/laporan-riset-kesehatan-dasar-riskesdas/
10. Centis, Maria Conchita Leyla, Yuni Kusmiyati, and Ari Sundowo. 2022. The Role of Acupressure Ki3, SP 6, ST 36, ST 25 to Increase Weight, Height, and Motor Development in Stunting Baduta. Mungkid: C1nta House Library