

EFFECTIVENESS OF ACUPUNCTURE AND HYPNOPUNCTURE IN IMPROVING FUNCTIONAL INDEPENDENCE AMONG STROKE PATIENTS

Hanung Prasetya, Chusnul Zulaika*

Diploma III Program in Acupuncture, Politeknik Kesehatan Kemenkes Surakarta, Jl. Letjen Sutoyo, Mojosongo, Kec. Jebres, Kota Surakarta, Jawa Tengah 57127, Indonesia

*chusnul.zulaika@gmail.com

ABSTRACT

Stroke is one of the leading causes of disability worldwide and often results in decreased functional independence and psychological distress among patients. Physical limitations, anxiety, stress, and reduced motivation during rehabilitation may inhibit optimal recovery. Integrative complementary therapies such as acupuncture and hypnopuncture are increasingly explored to support post-stroke rehabilitation through both physiological and psychological mechanisms. This study aimed to analyze the effectiveness of acupuncture and hypnopuncture in improving functional independence among stroke patients and to develop an evidence-based integrative rehabilitation approach. This study employed a quasi-experimental design with pre-test and post-test approaches involving two intervention groups: acupuncture and hypnopuncture. A total of 80 stroke patients participated in the study, consisting of 40 respondents in the acupuncture group and 40 respondents in the hypnopuncture group. Functional recovery was assessed using the Functional Independence Measure (FIM). Data analysis included the Wilcoxon signed-rank test and Mann–Whitney U test due to non-normal data distribution. The findings demonstrated significant improvements in FIM scores in both groups after intervention. In the acupuncture group, the median FIM score increased from 55.00 to 110.50 ($p < 0.001$). Similarly, the hypnopuncture group showed an increase from 54.50 to 115.00 ($p < 0.001$). Comparative analysis between groups revealed no statistically significant difference at post-test ($p = 0.056$), although the hypnopuncture group demonstrated a higher mean rank, indicating a tendency toward better functional recovery outcomes. These findings suggest that both acupuncture and hypnopuncture effectively improve functional independence in stroke patients, while hypnopuncture may provide additional psychological benefits that contribute to rehabilitation outcomes.

Keywords: acupuncture; functional independence measure; hypnopuncture; stroke; rehabilitation

INTRODUCTION

Stroke is a condition characterized by impaired blood supply to the brain, typically caused by either the rupture of a blood vessel or an obstruction due to a blood clot. This condition disrupts the delivery of oxygen and nutrients to brain tissue, resulting in neuronal damage and neurological deficits (World Health Organization (WHO), 2024).

Stroke is classified into two major types: ischemic stroke and hemorrhagic stroke. Ischemic stroke occurs when a blood vessel supplying the brain becomes obstructed, leading to partial or complete interruption of cerebral blood flow. It is the most common type of stroke, accounting for approximately 80% of all stroke cases worldwide (Junaidi, 2011). Individuals who experience stroke often suffer from a decline in their ability to perform daily activities independently. Recovery of muscle strength, particularly in the extremities, remains one of the major challenges faced by stroke survivors with hemiparesis. Approximately 80% of patients experience upper extremity impairments during the acute phase, while only one-third achieve complete functional recovery. Functional ability represents the activities that individuals are actually capable of performing in their daily lives, whereas functional capacity refers to the potential ability to perform activities across physical, spiritual, social, and psychological domains (Samudera et al., 2023).

Stroke causes various changes, including physical, social, and psychological impairments. Physical consequences may include loss of motor function resulting in paralysis on one side of the body, difficulty walking, and limitations in carrying out activities of daily living (Wang et al., 2019). Given the high prevalence and substantial burden of stroke, intensive and comprehensive management is required. Initial management of stroke patients should be conducted in hospitals equipped with integrated monitoring systems. In general, stroke management aims to maintain or improve physical, psychological, social, economic, and occupational functioning to the highest possible level. Rehabilitation programs commonly include physiotherapy, occupational therapy, psychotherapy, assistive device training, and physical exercise. Acupuncture has emerged as one of the complementary therapies recommended by the World Health Organization (WHO) for stroke rehabilitation (Junaidi, 2011) (Chen et al., 2014). Acupuncture is a therapeutic technique that has been practiced for more than 3,000 years. In stroke patients, psychological factors frequently hinder the recovery process, as many patients experience hopelessness and reluctance to participate in rehabilitation exercises. Hypnotherapy, as a mind-body intervention, may help enhance motivation and positive attitudes toward recovery. Therefore, the combination of acupuncture and hypnotherapy, known as hypnopuncture, may be considered a promising therapeutic approach for stroke rehabilitation (Prasetya & Kusumawati, 2023).

The Functional Independence Measure (FIM) is one of the most widely used instruments for evaluating patients' independence in performing activities of daily living. The instrument consists of 18 items covering both motor and cognitive domains, providing a comprehensive assessment of functional performance (Pozin et al., 2024) (Furuta et al., 2022). Higher FIM scores indicate greater levels of independence and are associated with improved quality of life (Peleg & Justo, 2024). Stimulation of specific acupuncture points in post-stroke patients can activate motor function pathways and facilitate neural connections between the affected hemisphere, the healthy hemisphere, and the limbic system. Acupuncture may also modulate motor-related neural networks involving the cerebellum and unaffected cerebral hemisphere. Furthermore, acupuncture has been shown to enhance glucose metabolism in healthy brain regions when glucose metabolism is reduced in the affected hemisphere, providing a physiological basis for its role in hemiplegic recovery (Yang et al., 2014). Various rehabilitation approaches have been developed to improve recovery outcomes among stroke survivors. Acupuncture is one of the most commonly utilized complementary therapies. It is believed to improve cerebral blood flow, reduce inflammation, enhance neurological function, and stimulate neuroplasticity, all of which play crucial roles in neurological recovery following stroke (Liang et al., 2022) (Qin et al., 2022). Several studies have reported that acupuncture can improve motor function, balance, and activities of daily living in stroke patients (Wu et al., 2010) (Yang et al., 2016).

In addition to physical impairments, stroke patients frequently experience psychological problems such as anxiety, depression, stress, loss of self-confidence, and reduced motivation to participate in rehabilitation programs (Hackett et al., 2005) (Hackett & Pickles, 2014). Poor psychological conditions may delay recovery and reduce adherence to prescribed therapeutic interventions (Wijeratne & Sales, 2021). Hypnotherapy is a therapeutic process designed to address cognitive, affective, behavioral, and other psychological problems through the use of suggestion and specific communication techniques (Prasetya et al., 2018). Hypnotherapy can induce positive emotional states that contribute to health improvement. Positive emotions stimulate the release of norepinephrine through the sympathetic nervous system, influencing lymphocyte activity through

adrenergic receptors expressed on immune cells. Consequently, norepinephrine modulates cellular activity and reduces serum levels of pro-inflammatory cytokines such as IL-1, IL-6, and TNF- α . This process subsequently decreases activation of the tryptophan-metabolizing enzyme indoleamine-2,3-dioxygenase (IDO), thereby inhibiting the production of 3-hydroxykynurenine (3OH-KYN) and quinolinic acid (QUIN) from tryptophan. As a result, tryptophan availability in the brain increases, leading to enhanced serotonin synthesis (Prasetya, 2017). The combination of hypnotherapy and acupuncture has the potential to improve rehabilitation outcomes in stroke patients. Hypnotherapy may help patients develop positive attitudes, increase motivation for recovery, and improve adherence to healthcare recommendations, while acupuncture may stimulate the nervous system and enhance cerebral blood circulation. Therefore, investigating the combined effects of hypnotherapy and acupuncture on stroke recovery is important and may provide valuable evidence for integrative rehabilitation strategies.

METHODS

Research design refers to the overall framework and structure of a study, including the processes of data collection and data analysis. This study employed a quantitative approach using a quasi-experimental. The study consisted of two intervention groups: an acupuncture group (n = 40) and a hypnopuncture group (n = 40). Functional independence was assessed using the Functional Independence Measure (FIM) before and after the intervention. Data analysis included univariate and bivariate analyses. Univariate analysis was performed to describe the characteristics of each study variable, while bivariate analysis was conducted to examine relationships between variables after testing for normality. Subsequently, hypothesis testing was performed. For normally distributed data, paired t-tests were used for paired observations, and independent t-tests were applied for unpaired data. For non-normally distributed data, the Wilcoxon Signed-Rank Test was used for paired data, whereas the Mann–Whitney U Test was used for unpaired data. This study received ethical approval from the Ethics Committee under Ethical Clearance Number: 32/EC-LPPM/UWHS/IV-2026.

RESULT AND DISCUSSION

The results present the characteristics of the respondents and changes in Functional Independence Measure (FIM) scores before and after the interventions in both the acupuncture and hypnopuncture groups. In addition, a comparative analysis was conducted to determine differences in functional independence outcomes between the two interventions among stroke patients.

Respondent characteristics were analyzed to provide an overview of the study participants based on sex, educational level, and age. This information is important to ensure that both groups had relatively comparable baseline characteristics before receiving the interventions.

Table 1.
Respondent characteristics (n= 80)

Respondent characteristics	f	%
Male	47	58,75
Female	33	41,25
Junior High School	9	11,25
Senior High School	47	58,75
Diploma	15	18,75
Bachelor's Degree	8	10,00
Master's Degree	1	1,25

As shown in Table 1, the majority of participants were male (58.75%), and most had completed senior high school education (58.75%). The mean age of the respondents was 55.54 ± 5.51 years, with an age range of 45–65 years.

To determine whether there was a difference in effectiveness between the two interventions, a comparative analysis using the Mann–Whitney U Test was performed on post-intervention FIM scores.

Table 2.
Comparison of Post-Intervention FIM Scores Between Groups

Group	n	Mean Rank	p
Acupuncture	40	35,56	0,056
Hypnopuncture	40	45,44	

The results of the Mann–Whitney U Test indicated that there was no statistically significant difference between the acupuncture and hypnopuncture groups. However, the hypnopuncture group demonstrated a higher mean rank compared to the acupuncture group.

The findings of this study demonstrated that both acupuncture and hypnopuncture significantly improved functional independence among stroke patients. These findings support previous studies suggesting that stroke rehabilitation requires a multidisciplinary approach to optimize patient recovery and functional outcomes (Winstein *et al.*, 2016)(Ke *et al.*, 2025). The improvement in FIM scores observed in the acupuncture group may be explained by several neurophysiological mechanisms. Stimulation of acupuncture points has been shown to enhance cerebral perfusion, improve brain tissue metabolism, reduce inflammation, and increase the release of neurotransmitters such as serotonin and dopamine. Furthermore, acupuncture promotes neuroplasticity, facilitating neural reorganization following stroke-related brain injury (Wang *et al.*, 2025)(Xie *et al.*, 2025). Previous studies have demonstrated that acupuncture contributes to motor function recovery and supports the rehabilitation process in patients with ischemic stroke (Legowo *et al.*, 2025). Similar findings have also reported improvements in activities of daily living following regular acupuncture treatment (Kim & Han, 2020).

The greater improvement in FIM scores observed in the hypnopuncture group may be attributed to the additional effects of hypnotherapy. Hypnotherapy helps patients achieve a state of deep relaxation, thereby reducing stress and anxiety, which are commonly experienced after stroke. Improved psychological well-being may enhance patient motivation and adherence to rehabilitation programs, ultimately contributing to better recovery outcomes (Prasetya & Kusumawati, 2023)(Kong *et al.*, 2010)

Hypnotherapy has also been reported to improve concentration, self-confidence, and emotional regulation. These factors may increase patient participation in rehabilitation exercises and subsequently enhance functional recovery (Hammond, 2010). Although statistical analysis revealed no significant difference between the two groups, the higher mean rank observed in the hypnopuncture group suggests a greater potential clinical benefit. This finding indicates that integrating physical and psychological interventions may provide more optimal rehabilitation outcomes compared to a single therapeutic approach (Patterson & Jensen, 2003).

The findings of this study have important implications for stroke rehabilitation practice.

Hypnopuncture may be considered a safe and feasible complementary intervention to improve functional independence among stroke patients. Nevertheless, further studies involving larger sample sizes and more rigorous randomized controlled trial designs are required to provide stronger evidence regarding the effectiveness of hypnopuncture.

CONCLUSIONS

Both acupuncture and hypnopuncture were found to be effective in improving Functional Independence Measure (FIM) scores among stroke patients. Significant improvements in functional independence were observed following both interventions. Although no statistically significant difference was found between the two groups, hypnopuncture demonstrated a tendency toward greater improvement in FIM scores compared to acupuncture alone. Therefore, hypnopuncture may be considered a complementary rehabilitation approach for enhancing functional independence and quality of life among stroke survivors.

ACKNOWLEDGEMENTS

The authors would like to express their sincere gratitude to Poltekkes Kemenkes Surakarta for funding this research through the Institutional Research Grant Program. The authors also thank all participants and healthcare professionals who contributed to this study.

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