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Effectiveness of Positive Psychology Intervention on Depression and Quality of Life of Post-Stroke Depressed Patients

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A B S T R A C T

Purpose: The objective of the present study was to examine the effectiveness of Positive Psychology Intervention (PPI) in reducing depressive symptoms and enhancing the quality of life in patients with PSD.

Methods and Materials: The present study utilized a quasi-experimental design with a pretest-posttest structure and a control group. The study population consisted of individuals diagnosed with post-stroke depression who attended psychotherapy clinics in Tehran in 2024. A sample of 30 patients with major depressive disorder (MDD) following a stroke was selected using convenience sampling and randomly assigned to either an intervention or control group. Following baseline assessments of depression and quality of life, participants in the intervention group received eight sessions of group-based Positive Psychology Intervention. Post-intervention assessments were conducted using the Beck Depression Inventory-II (BDI-II; Beck et al., 1996) and the Stroke-Specific Quality of Life Scale (SS-QOL; Williams et al., 1999). Data were analyzed using Analysis of Covariance (ANCOVA) in SPSS-26.

Findings: The results of one-way covariance analysis indicated that the intervention had a significant effect on depression ($F = 86.33$, $p < .05$) and quality of life ($F = 65.47$, $p < .05$). The effect of the covariate variable (pretest scores) was not significant ($p > .05$) for either depression or quality of life posttests.

Conclusion: The findings from this study underscore the effectiveness of Positive Psychology Intervention in reducing depressive symptoms and improving quality of life among patients with post-stroke depression. The results highlight the importance of incorporating positive psychological activities as a strategy to enhance the well-being of individuals affected by PSD.

Keywords: *Positive Psychotherapy, Depression, Quality of Life.*

1. Introduction

Post-stroke depression (PSD) is a highly prevalent psychiatric complication following a cerebrovascular accident, with considerable effects on recovery trajectories, functional independence, and quality of life. Studies have indicated that PSD is associated with greater morbidity and mortality among stroke survivors, as well as significantly impaired psychological well-being (Walsh, 2017). Traditional treatments, including pharmacological and cognitive-behavioral approaches, have yielded mixed results in addressing the complex interplay between neurological injury and emotional health. Consequently, the exploration of alternative and complementary therapeutic models, such as Positive Psychology Interventions (PPIs), has gained increased scholarly and clinical interest (Rashid, 2020).

Positive psychotherapy (PPT), a branch of positive psychology, seeks not only to alleviate symptoms of psychopathology but also to build psychological strengths and foster well-being. Instead of focusing primarily on symptom reduction, PPT emphasizes enhancing positive emotions, strengths, meaning, and engagement in life (Sabzi Arablou & Abdolali Zadeh, 2023). This orientation is particularly crucial in populations affected by chronic medical conditions, such as stroke survivors, whose emotional resilience and life satisfaction are often profoundly challenged (Khalili et al., 2022). Unlike traditional cognitive or behavioral therapies, PPT interventions incorporate techniques designed to cultivate optimism, gratitude, forgiveness, and personal strengths, which may offer unique advantages for PSD patients (Ashok Seshadri et al., 2021).

The efficacy of positive psychotherapy in managing depression and improving psychological outcomes has been supported across diverse populations. Meta-analytical findings demonstrate that PPT significantly reduces depressive symptoms while simultaneously enhancing positive psychological states, including hope, happiness, and life satisfaction (Thole Hilko, 2021). These findings underscore the potential utility of PPT as a dual-targeted intervention addressing both symptomatology and psychological flourishing. Furthermore, systematic reviews have advocated for the incorporation of PPT into routine mental health care practices, particularly for individuals managing chronic conditions where fostering positive psychological resources can directly impact physical and emotional recovery (Walsh, 2017).

In Iran, emerging evidence has further corroborated the benefits of PPT interventions among different clinical and non-clinical populations. Research by Kazemi et al. (Kazemi et al., 2020) compared the effectiveness of mindful acceptance therapy and positive psychotherapy on emotional capital in female students with depression, revealing superior outcomes for PPT in enhancing emotional capacities and reducing depressive symptoms. Similarly, Nasiri and colleagues (Nasiri et al., 2019) reported that adolescents with depression who received PPT demonstrated greater improvements in psychological well-being and lower depression levels compared to those receiving cognitive-behavioral therapy. These findings reinforce the cultural adaptability and effectiveness of PPT in Iranian samples, suggesting its potential application for PSD patients within the same cultural context.

Moreover, recent research has sought to compare PPT to other established therapeutic models. A study by Nourian et al. (Nourian et al., 2021) evaluated the relative effectiveness of Acceptance and Commitment Therapy (ACT) and PPT in reducing depression and improving emotional capital among depressed women. While both interventions were found to be effective, PPT demonstrated distinct advantages in enhancing positive psychological traits. Complementary findings by Shariat et al. (Shariat et al., 2021) highlighted that PPT contributed significantly to positive psychological characteristics and self-differentiation in retired teachers, providing additional support for the generalizability of PPT across different adult populations.

Post-stroke patients present unique challenges for psychotherapeutic interventions due to cognitive impairments, physical limitations, and existential concerns about identity and future life satisfaction. Therefore, interventions that go beyond symptom control to foster a sense of meaning, connectedness, and self-worth are particularly valuable. The emphasis of PPT on cultivating meaning aligns closely with the existential needs of individuals adjusting to life after a debilitating event such as a stroke (Noferesti et al., 2017). Positive psychological constructs, such as gratitude and optimism, may serve as protective factors that buffer against the enduring psychological distress often seen in PSD patients (Rashid, 2020).

Several clinical studies have demonstrated the applicability of PPT specifically in populations experiencing severe life challenges. Brownell et al. (Brownell et al., 2016) conducted a pilot randomized controlled trial on the application of PPT for individuals with psychosis, reporting

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significant reductions in depressive symptoms and improvements in overall well-being. These results support the idea that PPT can be adapted to populations with complex mental health needs, including those facing neurological disabilities. Moreover, Khodabakhash et al. (Khodabakhash et al., 2015) found that PPT significantly reduced depression symptoms and enhanced character strengths in cancer-affected patients, another group facing chronic health adversity and existential distress, further emphasizing the relevance of PPT to medically compromised populations.

Despite the growing body of evidence supporting the effectiveness of PPT, its application in PSD populations remains under-researched. Considering the multifaceted impact of stroke on emotional, cognitive, and social functioning, there is a critical need to investigate interventions that holistically address these domains. Recent advances have also highlighted the need for interventions tailored to improve not only symptomatology but also overall quality of life (QoL), which is often compromised after a stroke (Sabzi Arablou & Abdolali Zadeh, 2023). Enhancing QoL through PPT might be particularly effective, given its structured focus on building positive emotions and enhancing life satisfaction (Ashok Seshadri et al., 2021).

In addition to its theoretical appeal, the practicality and adaptability of PPT contribute to its feasibility in clinical settings. Positive psychotherapy techniques, such as gratitude journaling, identifying signature strengths, and envisioning best possible selves, are simple, accessible, and culturally adaptable interventions (Rashid, 2020). These features are especially advantageous in populations like PSD patients, where cognitive and physical impairments may limit engagement with more cognitively demanding therapies.

Given the existing evidence base and the specific psychological needs of PSD patients, this study aims to examine the effectiveness of Positive Psychology Interventions (PPIs) on reducing depressive symptoms and improving quality of life among post-stroke individuals diagnosed with major depressive disorder.

2. Methods and Materials

2.1. Study Design and Participants

The present study employed a quasi-experimental design with a pretest-posttest structure and a control group. The study population consisted of all post-stroke patients diagnosed with depression who attended psychotherapy clinics in Tehran in 2024. The sample included 30 patients with post-stroke major depressive disorder (MDD), selected initially through convenience sampling based on willingness to participate and fulfillment of the inclusion and exclusion criteria. Participants were then randomly assigned to either the intervention group (n = 15) or the control group (n = 15). Based on recommendations for pilot studies, a minimum sample size of 15 participants per group was required. Eligible participants were adults (≥18 years) diagnosed with post-stroke depression according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association, 2023), exhibiting high levels of depressive symptoms as measured by the Beck Depression Inventory-II (BDI-II; Beck et al., 1996), and providing written informed consent. Exclusion criteria included reduced intellectual functioning (IQ < 75), a full diagnosis of schizotypal personality disorder or antisocial personality disorder based on DSM-5 criteria, a comorbid mental health disorder requiring specialized treatment, current (within the past two months) substance dependence assessed via the Mini International Neuropsychiatric Interview (MINI), concurrent psychotherapeutic treatment, inability to comprehend Farsi, and failure to provide informed consent.

2.2. Data Collection

The Beck Depression Inventory-II (BDI-II) was developed by Beck et al. (1996) based on the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). This self-report questionnaire consists of 21 items assessing physical, behavioral, and cognitive symptoms of depression. Each item is rated on a 4-point scale ranging from 0 to 3, with total scores ranging from 0 to 63. The Cronbach's alpha coefficient for the American sample was .93. In Iranian samples, the Cronbach's alpha coefficient was reported as .87, with an average test-retest reliability coefficient of .78 and item-total correlation coefficients ranging from .36 to .64 (Haji-Adineh et al., 2019; Seghatoleslam et al., 2024).

The Stroke-Specific Quality of Life Scale (SS-QOL) is a 49-item questionnaire designed to assess quality of life across 12 domains relevant to stroke survivors, including mobility, self-care, mood, and cognition. Responses are rated on a 5-point Likert scale, with higher scores indicating better quality of life. The SS-QOL has demonstrated excellent internal consistency reliability (Cronbach's α = .92) (Türen et al., 2024; Uddin, 2024).

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2.3. *Intervention*

The intervention consisted of eight weekly sessions of Positive Psychology Intervention (PPI), each lasting between 60 and 90 minutes. The session structure was adapted from the framework proposed by Seligman et al. (2005) and supplemented by stroke-specific PPI models. The Positive Psychology Intervention (PPI) was conducted over eight weekly sessions, each lasting approximately 60 to 90 minutes. The first session introduced the participants to the goals of therapy, providing an overview of positive psychology principles and discussing the specific challenges associated with post-stroke depression (PSD). In the second session, participants engaged in gratitude exercises through the "Three Good Things" journaling activity, followed by group reflections to enhance positive affect. The third session focused on strengths identification, during which participants completed the VIA Survey and shared their character strengths with peers, receiving feedback to reinforce self-awareness and confidence. The fourth session emphasized mindfulness and emotional awareness, incorporating breathing techniques and exercises designed to foster present-moment attention. In the fifth session, the theme of positive relationships was addressed through activities such as writing gratitude letters and practicing verbal expressions of appreciation. The sixth session centered on cultivating optimism and goal setting, guiding participants to create SMART goals related to health, hobbies, and social engagement. The seventh session explored the concepts of meaning and purpose, encouraging participants to reflect on their life narratives and redefine their sense of purpose after experiencing a stroke. Finally, the eighth session focused on integration and closure, during which participants developed individualized action plans, discussed relapse prevention strategies, and shared reflections on their therapeutic journey.

2.4. *Data Analysis*

Following the pretest assessments, participants in the intervention group received eight sessions of PPI. Subsequently, posttest assessments were administered using the Beck Depression Inventory-II (BDI-II) and the Stroke-Specific Quality of Life Scale (SS-QOL). Data were analyzed using analysis of covariance (ANCOVA) via SPSS-26.

3. Findings and Results

The descriptive results for the demographic variables—age, gender, marital status, employment status, and education level—are presented in Table 1.

Table 1

Demographic Variables

Demographic Variable / Group	Control Group	Intervention Group
Age	30–35: 7	30–35: 7
	36–40: 6	36–40: 6
	41–45: 2	41–45: 2
Sex	Male: 4	Male: 5
	Female: 11	Female: 10
Occupation	Jobless: 5	Jobless: 8
	Employed: 9	Employed: 7
	Self-employed: 1	Self-employed: 0

In this study, employed participants had the highest frequency, while unemployed participants had the lowest. Most participants were within the 30–35 years age range. The means and standard deviations for the research variables in both the pretest and posttest are presented in Table 2.

Table 2

Descriptive Statistics of Variables

Variable	Statistical Indices	Intervention Group Pretest	Intervention Group Posttest	Control Group Pretest	Control Group Posttest
Depression	Mean	29.80	27.93	29.53	29.66
	Standard Deviation	3.27	3.76	4.29	3.94
Quality of Life	Mean	2.10	6.40	2.25	2.00
	Standard Deviation	1.50	1.70	1.20	1.20

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It was observed that the posttest mean score of depressive symptoms in the intervention group demonstrated a greater reduction. Inferential statistical analysis was conducted using analysis of covariance (ANCOVA). Prior to conducting ANCOVA, its assumptions were evaluated. The Kolmogorov–Smirnov test confirmed the normality of score distributions ($p > .05$). Additionally, Levene's test confirmed the equality of variances between the two groups for both depressive symptoms and quality of life in pretest and posttest assessments ($p > .05$). The assumption of homogeneity of regression slopes was also satisfied ($p = .221$).

The results of the one-way analysis of covariance are presented in Table 3.

Table 3

Results of One-Way Analysis of Covariance (ANCOVA)

Dependent Variable	Source	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance Level	η^2
Depression	Group	4561.02	1	4561.02	86.33	.039	.74
	Pretest	206.70	1	206.70	20.05	.12	
	Error	91.12	27	3.37			
Quality of Life	Group	10154.81	1	10154.81	65.47	.027	.68
	Pretest	403.40	1	403.40	11.04	.39	
	Error	441.45	27	16.35			

As shown in Table 3, the one-way covariance analysis indicated significant effects for depression ($F = 86.33$, $p < .05$) and quality of life ($F = 65.47$, $p < .05$). The effect of the covariate variable (pretest scores) was not significant ($p > .05$) for either depression or quality of life posttest scores. Therefore, the intervention significantly reduced depressive symptoms and improved quality of life among the participants.

4. Discussion and Conclusion

The present study aimed to examine the effectiveness of Positive Psychology Interventions (PPIs) in reducing depressive symptoms and improving quality of life among individuals with post-stroke depression (PSD). The findings revealed that participants in the intervention group experienced a significant reduction in depressive symptoms compared to the control group. Moreover, the quality of life of participants in the intervention group improved substantially following the intervention. These results highlight the potential of PPIs as a beneficial therapeutic approach for enhancing emotional well-being and life satisfaction in post-stroke individuals.

The significant reduction in depressive symptoms observed in this study aligns with the theoretical foundations and empirical findings of previous research on Positive Psychotherapy (PPT). Positive psychotherapy specifically targets the enhancement of positive emotions, strengths, and meaning, which are crucial elements in alleviating depressive symptoms (Rashid, 2020). Previous studies have similarly demonstrated the effectiveness of PPT in reducing depressive symptoms across various populations. For instance, Khalili et al. (Khalili et al., 2022) reported that positive psychotherapy significantly decreased depression and alexithymia in women applying for divorce. Likewise, Kazemi et al. (Kazemi et al., 2020) showed that positive psychotherapy effectively improved emotional capital and reduced depression among female students. These findings support the notion that interventions emphasizing positive psychological resources can effectively combat depressive symptomatology, particularly in individuals facing significant life challenges such as stroke.

The improvement in quality of life observed among participants receiving PPIs is consistent with prior studies indicating that positive psychotherapy not only reduces psychopathology but also promotes psychological flourishing. Sabzi Arablou and Abdolali Zadeh (Sabzi Arablou & Abdolali Zadeh, 2023) found that positive psychotherapy significantly enhanced quality of life, psychological well-being, and feelings of aging in individuals with panic disorder. Similarly, Ashok Seshadri et al. (Ashok Seshadri et al., 2021) highlighted the effectiveness of positive psychotherapy in fostering broader aspects of psychological well-being in patients with major depression. The emphasis of PPT on building optimism, gratitude, and life purpose likely contributed to the observed improvements in participants' quality of life in the present study.

These findings are further supported by meta-analytic and systematic reviews, which have provided robust evidence

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regarding the efficacy of PPT. Thole Hilko and Morina (Thole Hilko, 2021) conducted a meta-analysis showing that positive psychotherapy interventions significantly enhance positive psychological outcomes while reducing negative symptoms such as depression. Walsh et al. (Walsh, 2017) similarly concluded that PPT application in mental health care can effectively promote recovery by focusing on strengths rather than solely addressing deficits. The results of the present study thus converge with the broader literature emphasizing the importance of building positive psychological resources as a mechanism for improving mental health outcomes.

In the Iranian context, the current findings are consistent with earlier research highlighting the effectiveness of PPT. Nasiri et al. (Nasiri et al., 2019) demonstrated that positive psychotherapy was more effective than cognitive-behavioral therapy in improving psychological well-being and reducing depression among adolescents. Furthermore, Nourian et al. (Nourian et al., 2021) compared PPT and Acceptance and Commitment Therapy (ACT) in women with depression, finding significant positive changes associated with PPT in enhancing emotional capital and reducing depressive symptoms. Such findings highlight the cultural adaptability and relevance of positive psychotherapy techniques in Iranian populations, supporting the results of the current study conducted among Tehran-based participants.

An important aspect of the present results is the robust impact of PPIs even in a medically compromised population such as PSD patients. This supports previous findings that PPT can be effectively adapted to individuals with complex psychological and medical needs. Brownell et al. (Brownell et al., 2016) provided evidence that PPT could reduce depressive symptoms among individuals with psychosis, a population similarly characterized by significant mental health challenges. Likewise, Khodabakhash et al. (Khodabakhash et al., 2015) reported the efficacy of PPT in alleviating depression and enhancing character strengths among cancer patients. Together with the current findings, this body of work suggests that PPT's focus on fostering positive emotional experiences, strengths, and meaning is particularly valuable for populations facing chronic illness or disability.

The emphasis on belief in goodness, meaning-making, and resilience as core aspects of PPT may explain its strong impact on quality of life among PSD patients. Noferesti et al. (Noferesti et al., 2017) demonstrated that positive psychotherapy based on belief in goodness significantly decreased signs and symptoms of subclinical depression. In a similar vein, Shariat et al. (Shariat et al., 2021) showed that PPT improved positive psychological characteristics and self-differentiation, indicating its broader effects beyond mere symptom reduction. In the context of PSD, where individuals often struggle with a loss of autonomy, physical limitations, and existential despair, cultivating positive psychological constructs such as hope, gratitude, and life meaning appears to have a transformative effect on both depressive symptoms and quality of life.

Additionally, this study's findings are in line with contemporary calls for integrating positive psychology approaches into standard mental health interventions (Rashid, 2020; Walsh, 2017). As suggested by previous literature, traditional deficit-focused models may be insufficient to meet the holistic needs of patients coping with chronic health conditions. Interventions that foster positive psychological capacities can contribute not only to symptom reduction but also to promoting resilience, engagement, and life satisfaction, all of which are critical for comprehensive rehabilitation (Sabzi Arablou & Abdolali Zadeh, 2023; Thole Hilko, 2021).

Overall, the results of this study add to the growing body of evidence supporting the application of Positive Psychology Interventions in diverse clinical populations. They highlight the relevance and effectiveness of such approaches in enhancing the psychological health and quality of life of individuals suffering from post-stroke depression. Future research and clinical practice should continue to explore and refine these interventions to maximize their impact in neurorehabilitation settings.

Despite its promising findings, this study is subject to several limitations. First, the sample size was relatively small, which may limit the generalizability of the results. A larger sample would provide greater statistical power and more robust conclusions. Second, the study utilized convenience sampling from specific psychotherapy clinics in Tehran, potentially introducing selection bias and limiting the diversity of the sample. Third, the reliance on self-report measures, while widely accepted in psychological research, may be subject to response biases such as social desirability or inaccurate self-assessment. Additionally, the study's follow-up period was relatively short, preventing conclusions about the long-term sustainability of the intervention effects. Finally, the lack of a blinded design may have introduced expectation effects among participants and researchers.

Future research should aim to replicate these findings in larger and more diverse samples, including participants from

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different regions and backgrounds. Longitudinal studies with extended follow-up periods would be beneficial to assess the durability of the positive effects of PPIs over time. Moreover, future studies should consider incorporating objective measures of psychological and physical health, alongside self-report instruments, to enhance the validity of findings. Investigating the comparative effectiveness of PPIs against other established interventions, such as cognitive-behavioral therapy or mindfulness-based therapies, would also be valuable. Further research could explore the specific components of positive psychotherapy that are most effective in PSD populations and adapt intervention protocols accordingly.

Clinicians working with post-stroke patients should consider integrating Positive Psychology Interventions into rehabilitation programs to address depressive symptoms and enhance overall quality of life. Training rehabilitation teams in positive psychology techniques, such as gratitude exercises, strengths identification, and meaning-making interventions, can offer a practical and scalable approach to improving patient outcomes. Rehabilitation centers and outpatient clinics should prioritize holistic care models that foster not only physical recovery but also psychological flourishing. Tailoring positive psychotherapy exercises to accommodate physical and cognitive limitations common in post-stroke populations will further optimize intervention effectiveness. Encouraging patients to actively engage with positive emotional experiences and personal strengths can be a valuable adjunct to traditional medical and therapeutic treatments.

Authors' Contributions

This article is derived from the first author's doctoral dissertation. All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the interview and participated in the research with informed consent.

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