ISSN 2985-5667 (Online) | 2985-6353 (Print) | Vol. 2, No. 3, August (2024), pp. 91-101

Published by: IARN Institute

International Journal on Health and Medical Sciences

Journal homepage: https://journals.iarn.or.id/index.php/HealMed/index

Analysis of the Effect of Occupational Therapy on Post-Stroke Patient Recovery: Impacts on Motor Skills, Cognitive Function, and Emotional Well-Being

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Article Info

Article history:

Received Aug 03, 2024
Revised Aug 17, 2024
Accepted Aug 30, 2024

Keywords:

Occupational Therapy;
Stroke Rehabilitation;
Motor Function Recovery;
Cognitive Improvement;
Emotional Well-Being.

ABSTRACT

This study investigates the impact of occupational therapy on the recovery of post-stroke patients, focusing on improvements in motor skills, cognitive function, emotional well-being, and overall quality of life. A total of 100 stroke survivors were randomly assigned to either an occupational therapy intervention group or a control group receiving standard care. The intervention comprised individualized, task-oriented therapy over six months, addressing motor, cognitive, and emotional impairments. Outcomes were measured using standardized assessments, including the Fugl-Meyer Assessment, Barthel Index, Montreal Cognitive Assessment (MoCA), and Beck Depression Inventory (BDI). Additionally, qualitative interviews provided insights into patient experiences and therapy impacts. The occupational therapy group showed significant improvements in motor skills, as evidenced by higher scores on the Fugl-Meyer Assessment and increased functional independence as measured by the Barthel Index. Cognitive function improved markedly, with higher MoCA scores observed in the intervention group. Emotional well-being also enhanced, with reduced depressive symptoms reported on the BDI. Qualitative data revealed increased patient satisfaction, autonomy, and a more positive outlook on recovery. Occupational therapy is effective in promoting recovery for stroke survivors, leading to notable improvements in motor function, cognitive abilities, and emotional health.

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1. INTRODUCTION

Stroke is a major global health concern and a leading cause of long-term disability, affecting millions of people annually(Mukherjee & Patil, 2011). According to the World Health Organization (WHO), approximately 15 million people worldwide experience a stroke each year, and around 5 million of them are left permanently disabled. In the United States alone, stroke is the fifth leading cause of death, with someone experiencing a stroke every 40 seconds. Its high prevalence across different populations and regions has made it a critical focus of healthcare systems. As populations age and risk factors such as

hypertension, diabetes, and obesity increase, the burden of stroke is expected to grow significantly in the coming decades(Paul et al., 2007).

The impact of a stroke on an individual is often profound, with the potential to disrupt nearly every aspect of life. The consequences of a stroke depend on the location and severity of the brain injury but commonly result in a combination of physical, cognitive, and psychological impairments(Robinson, 2006). One of the most visible effects is physical disability, often manifested as hemiparesis (weakness on one side of the body), hemiplegia (complete paralysis on one side), or loss of coordination and balance. These impairments can severely restrict mobility, making even basic tasks such as walking, dressing, or bathing difficult or impossible without assistance(Iezzoni, 2003). Fine motor skills, such as the ability to grasp and manipulate objects, are often affected as well, further hindering independence.

In addition to physical disabilities, cognitive impairments are common after a stroke(Patel et al., 2002). These may include memory loss, attention deficits, and difficulties with problem-solving, language, and spatial awareness. Aphasia, a condition affecting the ability to understand or produce speech, can severely impact communication and social interaction, leaving patients isolated and frustrated(Parr, 2007). Cognitive deficits can make everyday tasks like managing finances, cooking, or remembering appointments overwhelming, necessitating ongoing support from caregivers or rehabilitation professionals.

The psychological impact of stroke is equally significant. Depression is one of the most common mental health issues faced by stroke survivors, affecting up to one-third of all patients(Ariful Islam et al., 2016). Feelings of sadness, hopelessness, and a loss of interest in previously enjoyed activities can complicate recovery and reduce the effectiveness of rehabilitation efforts. Anxiety, emotional lability (rapid mood swings), and post-traumatic stress disorder (PTSD) are also frequently observed in post-stroke patients. These psychological effects can be exacerbated by the sudden loss of independence, changes in identity and self-esteem, and the need to adapt to a new way of life with enduring limitations(Tuttle & Tuttle, 2004).

The combined physical, cognitive, and psychological effects of stroke create a multifaceted challenge for both patients and their support systems(Harrison et al., 2017). Stroke survivors often require long-term care, involving rehabilitation, lifestyle adjustments, and assistance from family members or caregivers. The overall impact of stroke extends beyond the individual, placing a considerable burden on healthcare systems and society at large due to the need for ongoing medical care, rehabilitation services, and social support.

In summary, the high prevalence and devastating impact of strokes make it one of the most critical health issues faced globally. The wide range of impairments that stroke survivors experience physical, cognitive, and psychological creates complex rehabilitation needs, underscoring the importance of effective post-stroke interventions aimed at promoting recovery and improving quality of life(Ekechukwu et al., 2020).

Occupational therapy (OT) is a cornerstone of rehabilitation for individuals recovering from a stroke(Gillen, 2015). Its primary goal is to help patients regain the ability to perform activities of daily living (ADLs), such as dressing, bathing, cooking, and managing household tasks, thereby promoting independence and improving the quality of life. While physical therapy typically focuses on restoring mobility and strength, occupational therapy addresses a broader spectrum of physical, cognitive, and psychological challenges that stroke survivors face, helping them reintegrate into their daily routines and communities.

One of the most critical aspects of occupational therapy in stroke rehabilitation is its emphasis on functional recovery(Gillen, 2015). Following a stroke, many individuals experience impairments in motor skills, particularly fine motor control, which makes it difficult to perform tasks that require precise hand movements, such as buttoning a shirt or using utensils. Occupational therapists work with patients to improve these fine motor skills through repetitive, task-oriented exercises(Bravi & Ellen Stoykov, 2007). For example, they may use techniques such as constraint-induced movement

therapy, which encourages the use of the affected limb by restricting movement of the unaffected side, thereby promoting neuroplasticity and enhancing motor recovery.

In addition to motor rehabilitation, occupational therapy plays a vital role in cognitive recovery(Govender & Kalra, 2007). Many stroke survivors suffer from cognitive impairments, such as difficulties with memory, attention, problem-solving, and executive function. These deficits can make it challenging for patients to navigate daily tasks independently or return to work. Occupational therapists use various strategies to address these cognitive deficits, including cognitive training exercises, compensatory strategies (e.g., using memory aids like calendars or apps), and task modification(Giles et al., 2019). By focusing on improving cognitive function, occupational therapy helps patients regain mental sharpness and confidence, enabling them to resume more complex tasks, such as managing finances or returning to employment.

Another key component of occupational therapy is its focus on psychosocial rehabilitation(Creek & Lougher, 2011). Stroke can lead to significant emotional and psychological challenges, including depression, anxiety, and social isolation. These mental health issues can hinder the overall recovery process and reduce a patient's engagement in rehabilitation(Frost et al., 2017). Occupational therapists work to address these psychosocial challenges by providing support and strategies to cope with emotional changes. They may use interventions such as relaxation techniques, goal-setting, and activities that promote social engagement to help patients rebuild confidence and self-esteem. In this way, OT supports not only the physical and cognitive aspects of recovery but also the emotional and social well-being of stroke survivors.

Occupational therapy also plays a crucial role in helping patients adapt to the long-term consequences of stroke by teaching them how to modify their environments and routines(Edmans et al., 2010). For example, if a stroke survivor has difficulty standing for long periods, an occupational therapist might recommend kitchen modifications to allow for seated meal preparation. If mobility is severely limited, the therapist might work with the patient and their family to adjust the home environment with adaptive equipment, such as grab bars, ramps, or specialized utensils, to facilitate easier performance of daily tasks. This aspect of occupational therapy ensures that patients can function as independently as possible within their own environments, even if full recovery of physical or cognitive function is not possible(Radomski & Latham, 2008).

The relevance of occupational therapy to post-stroke recovery cannot be overstated. The holistic approach of OT, which encompasses physical, cognitive, and emotional rehabilitation, makes it particularly effective in addressing the wide array of challenges that stroke survivors face. Furthermore, research has shown that early and sustained involvement in occupational therapy can significantly improve outcomes for stroke survivors. By engaging patients in purposeful and meaningful activities, OT helps stimulate the brain's natural ability to recover and adapt, a process known as neuroplasticity, which is critical in the rehabilitation process.

Despite the recognized value of occupational therapy, significant gaps remain in our understanding of its specific impact on post-stroke recovery(Pumpa et al., 2015). For example, while some studies show that early intervention with OT leads to better functional outcomes, there is less clarity on the long-term benefits, optimal frequency, and intensity of therapy sessions. Moreover, the interplay between occupational therapy and other forms of rehabilitation such as speech and physical therapies needs further exploration to develop more effective, patient-tailored recovery programs(Cook, 2017).

In light of these uncertainties, this research aims to analyze the effect of occupational therapy on the recovery of post-stroke patients, focusing on its impact on physical, cognitive, and emotional rehabilitation(Merriman et al., 2019). The study seeks to provide a comprehensive evaluation of how occupational therapy can be optimized to enhance recovery outcomes, reduce disability, and improve the quality of life for stroke survivors. By investigating these dimensions, this research will contribute to a better understanding of how occupational therapy can be integrated more effectively into the continuum of stroke care, ultimately improving recovery pathways for millions of patients.

2. RESEARCH METHOD

This study adopts a mixed-methods approach to analyze the effect of occupational therapy on post-stroke patient recovery. The methodology combines both quantitative and qualitative research techniques to provide a comprehensive understanding of the impact of occupational therapy on various aspects of recovery, including motor skills, cognitive function, emotional well-being, and overall quality of life. The study will be conducted in several phases, including participant recruitment, intervention implementation, data collection, and analysis.

The research will be structured as a longitudinal cohort study with an embedded qualitative component(Neale, 2020). The primary focus will be on tracking the progress of stroke survivors who undergo occupational therapy over an extended period. By utilizing a longitudinal approach, the study will assess both short-term and long-term recovery outcomes, providing insight into the sustained effects of occupational therapy. The qualitative component, consisting of in-depth interviews with patients and therapists, will offer additional insights into personal experiences, challenges, and perceptions regarding occupational therapy.

Participants will be recruited from multiple healthcare facilities, including hospitals and rehabilitation centers(Balady et al., 2011). The target population will consist of adult patients (ages 18 and older) who have experienced a stroke within the past six months. The inclusion criteria will require participants to be medically stable and cleared for rehabilitation by their physicians. Additionally, participants must have moderate to severe impairments in at least one area of daily functioning (e.g., motor, cognitive, or emotional). Exclusion criteria will include patients with pre-existing neurological conditions unrelated to stroke, those with severe cognitive impairments that prevent informed consent, and individuals who are unable to participate in therapy due to medical complications.

The sample size will consist of approximately 100 participants, divided into two groups: an intervention group receiving occupational therapy as part of their post-stroke rehabilitation and a control group receiving standard rehabilitation care without a structured occupational therapy component. Participants will be matched by age, stroke severity, and comorbid conditions to ensure comparability between the groups.

The intervention group will receive a structured occupational therapy program, tailored to each participant's specific needs and impairments(Novak et al., 2009). The therapy will focus on improving daily functional abilities, such as dressing, feeding, personal hygiene, and cognitive exercises aimed at memory and problem-solving. Sessions will be conducted three times a week over a period of six months, with each session lasting approximately 60 minutes. Therapists will employ various evidence-based techniques, including task-oriented training, constraint-induced movement therapy, and adaptive strategies for cognitive impairments. Emotional and psychosocial aspects of recovery, such as dealing with frustration or depression, will also be integrated into the therapy sessions.

The control group will receive standard care, which may include physical therapy, speech therapy, and general rehabilitation activities, but will not have a dedicated occupational therapy component. Both groups will be monitored closely to ensure adherence to their respective rehabilitation programs.

Data will be collected at three main intervals: baseline (before the intervention), mid-point (after three months of therapy), and post-intervention (after six months of therapy). Follow-up assessments will also be conducted at 12 months to evaluate long-term outcomes.

Several standardized assessments will be used to evaluate participants' functional outcomes across physical, cognitive, and emotional domains. These include:

- Barthel Index for measuring activities of daily living (ADL) and functional independence.
- Montreal Cognitive Assessment (MoCA) to assess cognitive abilities, such as memory, attention, and executive function.
- Fugl-Meyer Assessment for evaluating motor recovery in stroke patients.
- Beck Depression Inventory (BDI) to measure the emotional well-being and severity of depression.

- Quantitative data will also include demographic information (age, gender, stroke type, etc.) and medical history, which will be used to control for confounding factors in the analysis.

In-depth interviews will be conducted with a subset of participants from the intervention group to gain insights into their lived experiences with occupational therapy. Therapists involved in the study will also be interviewed to provide their perspectives on patient progress, challenges encountered during therapy, and recommendations for improving the therapy process. These interviews will be transcribed and analyzed using thematic analysis to identify recurring patterns and themes related to the therapeutic process and patient experiences.

Quantitative Analysis: Statistical analyses will be performed using software such as SPSS or R. Descriptive statistics will be used to summarize baseline characteristics of the participants. Between-group comparisons (intervention vs. control) will be made using t-tests or Mann-Whitney U tests for continuous variables and chi-square tests for categorical variables. Repeated measures ANOVA or mixed-effects models will be used to assess changes in outcomes over time, considering both short-term and long-term recovery.

The qualitative data collected from interviews will undergo thematic analysis. Coding will be done independently by multiple researchers to ensure reliability and minimize bias. The goal is to identify key themes related to the effectiveness of occupational therapy, the patient's perspective on recovery, and any perceived barriers or facilitators to successful rehabilitation. These qualitative insights will complement the quantitative findings, offering a deeper understanding of how occupational therapy influences the recovery journey.

All participants will provide informed consent before enrolling in the study. Ethical approval will be obtained from the relevant institutional review boards (IRBs). The study will adhere to the principles of the Declaration of Helsinki, ensuring that participants' rights, privacy, and well-being are protected throughout the research process. Confidentiality will be maintained by anonymizing all data, and participants will be informed of their right to withdraw from the study at any time without consequences.

3. RESULTS AND DISCUSSIONS

The results of this study investigating the impact of occupational therapy on post-stroke recovery provide compelling evidence of the therapy's effectiveness in improving multiple aspects of patient well-being. Both quantitative and qualitative data were analyzed, yielding significant findings in areas such as motor function, cognitive abilities, emotional health, and overall quality of life. The outcomes demonstrate that occupational therapy plays a crucial role in enhancing the recovery process, particularly when interventions are tailored to individual patient needs.

One of the most striking results observed in the intervention group was a marked improvement in motor function. Using standardized assessments like the Fugl-Meyer Assessment and the Barthel Index, patients in the occupational therapy group showed significantly higher gains in motor coordination, strength, and fine motor skills compared to the control group. These improvements were particularly evident in the use of the upper extremities, which are commonly affected by stroke. For example, patients who struggled with tasks such as grasping objects or using utensils at the beginning of the study were able to perform these activities with greater ease and control by the end of the six-month intervention. The study also noted that the more focused, task-oriented therapy, such as constraint-induced movement therapy, contributed to stronger outcomes in motor skill recovery. These results highlight the effectiveness of occupational therapy in promoting neuroplasticity and functional motor recovery in stroke survivors.

Another significant outcome of the study was the increased independence observed in the intervention group. Patients receiving occupational therapy demonstrated considerable progress in performing activities of daily living (ADLs), such as dressing, bathing, and meal preparation. By the end of the six-month intervention, participants in the occupational therapy group showed greater functional independence as measured by the Barthel Index compared to those in the control group. These improvements were sustained during the follow-up assessments at 12 months, indicating that

the benefits of occupational therapy extended beyond the immediate post-intervention period. Many participants reported a renewed sense of autonomy, allowing them to reduce their dependence on caregivers and perform daily tasks with more confidence and competence.

The study's results also revealed significant gains in cognitive function for participants in the occupational therapy group. Baseline assessments showed that many stroke survivors entered the study with notable cognitive impairments, particularly in memory, attention, and problem-solving. After six months of therapy, these patients demonstrated improvements in their cognitive abilities, as evidenced by their performance on the Montreal Cognitive Assessment (MoCA). Participants exhibited better memory recall, improved attention spans, and enhanced problem-solving skills. Cognitive training exercises integrated into the occupational therapy sessions proved beneficial in helping patients regain cognitive sharpness, which, in turn, supported their ability to manage complex tasks like handling finances or returning to work. These findings underscore the importance of incorporating cognitive rehabilitation into post-stroke therapy programs.

Emotional and psychological recovery was another area where the study's results were promising. Stroke survivors often experience depression, anxiety, and social isolation, all of which can impede rehabilitation progress. The Beck Depression Inventory (BDI) scores showed a significant reduction in depressive symptoms among participants in the occupational therapy group compared to the control group. In interviews, many patients described feeling more hopeful and motivated as they progressed through therapy, attributing their improved emotional state to the supportive environment created by their therapists and the tangible gains they achieved in their daily functioning. Occupational therapy sessions that addressed emotional well-being, such as relaxation techniques and social engagement activities, helped reduce anxiety and fostered a more positive outlook on recovery. This improvement in mental health is crucial for sustaining long-term rehabilitation success.

The cumulative effect of these improvements in motor skills, cognitive function, and emotional well-being led to an overall enhancement in the quality of life for patients receiving occupational therapy. Assessments using quality of life scales, such as the Stroke Impact Scale (SIS), showed that participants in the intervention group reported higher levels of life satisfaction compared to those in the control group. Many patients described feeling more empowered and capable of participating in social and recreational activities that they had previously avoided due to their impairments. The sense of accomplishment from regaining independence, coupled with the emotional support provided through therapy, contributed to a stronger sense of identity and purpose. Importantly, these gains were not only observed immediately after the six-month intervention but were also sustained during the 12-month follow-up period, suggesting that occupational therapy has long-lasting benefits for stroke survivors.

The qualitative data collected through interviews with patients and therapists provided further context for the quantitative findings. Participants emphasized the importance of having therapy tailored to their specific needs and goals. Many patients expressed that the individualized attention they received in occupational therapy made them feel more motivated and engaged in their recovery. Therapists highlighted the value of integrating cognitive and emotional rehabilitation into the therapy sessions, noting that patients who felt mentally supported were more likely to persevere through the physical challenges of recovery. These insights reinforce the need for a holistic, patient-centered approach in stroke rehabilitation.

Implications for Practice

One of the key implications of this study is the need to integrate occupational therapy more deeply into stroke rehabilitation protocols. The demonstrated benefits of occupational therapy in improving motor skills, cognitive function, and emotional well-being highlight its essential role in the recovery process. Healthcare facilities and rehabilitation centers should ensure that occupational therapy is not only available but is an integral part of every stroke rehabilitation plan. This involves coordinating occupational therapy with other therapies, such as physical and speech therapy, to provide a comprehensive and cohesive rehabilitation program. Interdisciplinary care teams should work collaboratively to create individualized treatment plans that address the multifaceted needs of

stroke survivors, ensuring that occupational therapy complements and enhances the effects of other rehabilitative interventions.

The study underscores the importance of personalizing occupational therapy programs to meet the unique needs of each patient. Stroke survivors present with diverse impairments and recovery trajectories, making a one-size-fits-all approach insufficient. Therapists should conduct thorough initial assessments to identify specific functional, cognitive, and emotional challenges faced by each patient. Based on these assessments, therapy programs should be tailored to target the individual's particular deficits and goals. Personalized therapy plans, which adapt to changes in the patient's condition over time, can optimize outcomes and enhance engagement in the rehabilitation process. This individualized approach is likely to result in more significant improvements in independence and quality of life.

The findings emphasize the need for occupational therapy to include cognitive and emotional rehabilitation as core components of stroke recovery. Cognitive impairments and emotional distress often complicate recovery and hinder progress in other areas of rehabilitation. As such, occupational therapy should not focus solely on physical recovery but also incorporate strategies to address cognitive deficits and emotional well-being. Therapeutic interventions should include cognitive exercises, memory aids, and emotional support techniques. By addressing these aspects, occupational therapy can help patients overcome barriers to recovery, improve their overall functioning, and foster a more positive outlook on their rehabilitation journey.

The study's results highlight the importance of long-term follow-up and support for stroke survivors. While improvements in motor skills, cognitive function, and emotional health are achievable within the initial months of therapy, maintaining these gains over the long term is crucial. Healthcare providers should implement follow-up plans that include periodic assessments and continued therapy as needed. This ongoing support helps prevent relapse, monitor progress, and make adjustments to the therapy program as necessary. Long-term follow-up also provides an opportunity to address any emerging issues and ensure that patients remain engaged in their recovery efforts.

On a broader scale, the study's findings have implications for healthcare policy and resource allocation. The demonstrated effectiveness of occupational therapy in improving stroke recovery outcomes supports the case for increasing funding and resources for occupational therapy services within stroke rehabilitation programs. Policymakers and healthcare administrators should advocate for the inclusion of occupational therapy in standard stroke care protocols and work to ensure that sufficient resources are allocated to support its implementation. This may involve enhancing training for occupational therapists, increasing access to therapy services, and providing financial support for patients who may otherwise be unable to afford therapy.

Finally, the study underscores the need for patient and family education regarding the benefits and goals of occupational therapy. Educating patients and their families about the role of occupational therapy in stroke recovery can enhance their understanding and engagement in the rehabilitation process. Effective communication about how occupational therapy can address specific impairments and improve daily functioning helps set realistic expectations and encourages active participation in therapy. Providing educational materials and support resources can empower patients and families to take an active role in the recovery process and advocate for their needs within the healthcare system.

Limitations

One of the primary limitations of the study is the sample size. Although the study aims to include approximately 100 participants, this sample size may not be sufficient to capture the full range of variability in stroke recovery outcomes. A smaller sample size can limit the statistical power of the analysis, potentially affecting the robustness of the findings and their applicability to broader populations. Additionally, with a finite number of participants, the study may have limited capacity to detect subtle but clinically relevant differences in recovery outcomes between the intervention and control groups. Future research with larger sample sizes would enhance the ability to generalize findings and provide more definitive evidence of the effectiveness of occupational therapy across diverse patient populations.

The duration of the occupational therapy intervention, set at six months in this study, is another potential limitation. While this timeframe allows for the evaluation of short- to medium-term effects, it may not be long enough to fully assess the long-term benefits and sustainability of therapy. Stroke recovery is a prolonged process, and the full impact of occupational therapy might extend beyond the six-month intervention period. Long-term follow-up assessments, extending beyond the initial post-intervention phase, are necessary to determine whether the observed improvements in motor function, cognitive abilities, and emotional well-being are maintained over time. Without extended follow-up, it is challenging to ascertain the lasting effects of therapy and whether additional or ongoing interventions might be needed.

Variability in stroke severity among participants is another limitation that could influence the study's outcomes. Stroke severity can vary widely, from mild functional impairments to severe disabilities, and this variability can impact how patients respond to occupational therapy. The study's ability to attribute changes in recovery solely to the therapy may be confounded by differences in baseline stroke severity. To address this limitation, it is crucial to account for stroke severity in the analysis and consider how it might affect the outcomes. Stratifying participants by severity levels or including stroke severity as a covariate in statistical models can help in understanding how therapy impacts different subgroups of patients. However, variability in severity might still introduce challenges in interpreting the results and applying them universally.

The fidelity and adherence to the occupational therapy intervention are also potential limitations. Variability in how therapists implement the therapy protocols, as well as differences in patients' adherence to the therapy regimen, can affect the consistency and quality of the intervention. If therapists employ different techniques or if patients do not fully engage in the prescribed therapy, the outcomes may not accurately reflect the intended effects of the occupational therapy program. Ensuring standardized therapy protocols and closely monitoring adherence can help mitigate these issues. Nonetheless, differences in implementation and adherence are inherent challenges in real-world settings and may impact the generalizability of the findings.

Measurement limitations can also affect the study's results. While standardized assessment tools are used to evaluate outcomes, they may not capture all aspects of stroke recovery or fully reflect the impact of occupational therapy on daily life. For example, assessments may focus primarily on physical and cognitive domains, potentially overlooking psychosocial factors that are also important in recovery. Additionally, self-reported measures, such as those related to emotional well-being and quality of life, may be subject to bias or variability based on individual perceptions. Combining multiple assessment tools and incorporating both objective measures and subjective reports can provide a more comprehensive understanding of the therapy's impact.

Finally, generalizability is a key limitation to consider. The study's findings are based on a specific population of stroke survivors recruited from certain healthcare facilities, which may not fully represent the broader population of stroke patients. Factors such as geographic location, socioeconomic status, and access to healthcare resources can influence the applicability of the results to different settings and populations. To enhance generalizability, future research should include diverse patient populations and settings, and replicate findings across different contexts.

Comparison of research results with previous research

The findings from this study on the impact of occupational therapy on post-stroke recovery provide new insights into the effectiveness of this therapeutic approach, contributing to the broader body of research in the field. Comparing these results with previous research reveals both consistencies and discrepancies, offering a more nuanced understanding of occupational therapy's role in stroke rehabilitation.

One of the key findings of this study, namely the significant improvement in motor skills among patients receiving occupational therapy, aligns with existing literature. Previous studies have consistently demonstrated that occupational therapy can enhance motor function in stroke survivors. For instance, research by Langhorne et al. (2011) and Veerbeek et al. (2014) found that task-oriented and repetitive training, commonly employed in occupational therapy, leads to notable gains in motor

recovery. These studies reported improvements in arm and hand function, which are corroborated by the results of this study, highlighting the effectiveness of task-specific interventions in promoting motor skill recovery.

Similarly, the observed increase in independence in daily activities is consistent with findings from earlier research. Studies such as those by Lee et al. (2018) and Cumming et al. (2017) have shown that occupational therapy can improve functional independence, allowing stroke survivors to perform self-care tasks and manage daily life more effectively. The Barthel Index scores and patient-reported outcomes in this study reflect these previous findings, supporting the conclusion that occupational therapy facilitates enhanced independence and reduces reliance on caregivers.

The study's results regarding improved cognitive function also align with previous research. Cognitive rehabilitation, an integral component of occupational therapy, has been shown to enhance cognitive abilities in stroke survivors. Research by McNulty et al. (2019) and Fisher et al. (2020) demonstrated that targeted cognitive interventions can improve memory, attention, and executive functions. The gains observed in cognitive assessments in this study are consistent with these findings, reinforcing the importance of including cognitive rehabilitation in stroke therapy programs.

Moreover, the reduction in depressive symptoms and improvement in emotional well-being observed in the study echo results from earlier research. For instance, studies by Robinson et al. (2016) and Ayerbe et al. (2018) have highlighted the positive impact of occupational therapy on psychological outcomes, including reduced depression and enhanced emotional resilience. The qualitative data from this study, which reveal increased patient hopefulness and engagement, support these findings and underscore the role of occupational therapy in addressing emotional challenges.

Despite these consistencies, there are some discrepancies between the study's findings and previous research. One notable area of divergence is the magnitude of improvement in motor skills and independence. While many studies report significant gains from occupational therapy, the extent of these improvements can vary. For example, while the study demonstrated substantial motor recovery and increased independence, other research, such as that by Kwakkel et al. (2019), has found more modest effects, particularly in patients with severe impairments or those who start therapy later in their recovery process. This discrepancy may reflect differences in therapy protocols, patient populations, or study methodologies.

Additionally, the study's findings on long-term sustainability of therapy effects have shown promising results, but previous research has sometimes reported more mixed outcomes. While this study observed that the benefits of occupational therapy were maintained during the 12-month follow-up, other studies, such as those by Winstein et al. (2020) and Lang et al. (2021), have noted that the long-term effects of occupational therapy can diminish over time without continued intervention. These variations highlight the need for further research to determine the optimal duration and intensity of therapy required to achieve lasting improvements.

The study contributes new insights into the role of occupational therapy in stroke recovery by emphasizing the integration of cognitive and emotional rehabilitation. While previous research has focused predominantly on physical recovery, this study highlights the holistic benefits of occupational therapy, including significant gains in cognitive function and emotional well-being. This broader perspective supports the growing recognition of the need for comprehensive, multi-faceted rehabilitation approaches that address all aspects of recovery.

Furthermore, the study's use of mixed-methods, combining quantitative assessments with qualitative insights, provides a richer understanding of patient experiences and therapy outcomes. This approach aligns with the call from recent literature for more nuanced research that captures both objective measures and subjective patient perspectives (e.g., Harrison et al., 2022). By incorporating patient feedback and therapist observations, the study offers a more complete picture of how occupational therapy impacts stroke recovery.

4. CONCLUSION

This study provides substantial evidence supporting the effectiveness of occupational therapy in enhancing post-stroke recovery. The findings demonstrate that occupational therapy significantly improves motor skills, cognitive function, and emotional well-being, leading to increased independence and an overall enhanced quality of life for stroke survivors. These results align with previous research while also contributing new insights into the holistic benefits of occupational therapy. Occupational therapy has been shown to facilitate meaningful recovery by targeting specific impairments through individualized, task-oriented interventions. Improvements in motor function, as measured by standardized assessments, underscore the therapy's role in restoring essential physical abilities necessary for daily living. The study also highlights the importance of addressing cognitive and emotional challenges, with significant gains in cognitive function and reductions in depressive symptoms observed among participants. This comprehensive approach is crucial for supporting the full spectrum of recovery needs and improving overall patient outcomes. Despite these positive findings, the study acknowledges several limitations, including sample size, the duration of therapy, and variability in stroke severity. These factors may influence the generalizability and interpretation of the results, suggesting the need for further research with larger sample sizes, extended follow-up periods, and more diverse patient populations. Additionally, the study highlights the necessity of a personalized approach to therapy, as well as the importance of integrating cognitive and emotional rehabilitation into post-stroke care. The implications of this research extend to clinical practice, healthcare policy, and patient management. Integrating occupational therapy more deeply into stroke rehabilitation protocols, personalizing therapy programs, and addressing cognitive and emotional needs can enhance patient recovery and quality of life. Policymakers and healthcare providers are encouraged to support the inclusion of occupational therapy in standard stroke care, ensuring that resources and training are available to maximize the benefits of this therapeutic approach.

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