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ORIGINAL RESEARCH

Meditation as a Tool for Symptom Relief in Schizophrenia: Bridging Neuroscience and Mental Health

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Abstract

Background: Schizophrenia, characterized by symptoms such as auditory and visual hallucinations, imposes significant challenges on mental health care. Recent research highlights the potential of meditation to alleviate symptoms by enhancing emotional regulation and neuroplasticity. This study examines the role of meditation as an adjunctive therapy for schizophrenia, exploring its neurobiological underpinnings and practical integration into care models.

Methods: A mixed-methods approach was employed. Quantitative data were analyzed from clinical trials and intervention studies assessing meditation-based therapies in schizophrenia. Metrics included changes in symptom severity, cognitive performance, and quality of life using standardized scales such as PANSS and WHO-QOL. Qualitative data were collected through structured interviews with patients and practitioners, analyzed using thematic analysis to identify recurring patterns and insights into the feasibility and cultural acceptance of meditation in schizophrenia care. Statistical analyses were performed to evaluate effect sizes and correlations between meditation practices and symptom improvement.

Results: Findings indicate that meditation significantly modulates neural circuits associated with stress and emotional dysregulation, reducing symptom severity and improving coping mechanisms. Quantitative analysis revealed consistent reductions in PANSS scores ($p<0.05$) and improved quality-of-life measures. Thematic analysis highlighted increased self-awareness and reduced distress from hallucinations as key benefits. Providers emphasized the need for personalized meditation protocols tailored to individual symptom profiles.

Conclusion: Meditation offers a promising complementary strategy for managing schizophrenia symptoms, supported by both quantitative and qualitative evidence. Its integration into treatment plans requires interdisciplinary collaboration and sensitivity to cultural contexts. Future research should focus on long-term efficacy and refining protocols to maximize therapeutic outcomes.

Keywords: Schizophrenia, Meditation, Neuroplasticity, Emotional Regulation, Complementary Therapies, Mental Health, Psychosocial Interventions

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1. Introduction

Schizophrenia is a debilitating mental health disorder characterized by hallucinations, delusions, cognitive impairments, and emotional dysregulation [1]. While antipsychotic medications are the cornerstone of treatment, they often fail to address negative symptoms such as social withdrawal and anhedonia, which remain resistant to treatment [2]. Additionally, long-term antipsychotic use is associated with significant side effects, highlighting the need for complementary therapies that enhance treatment efficacy and improve patient outcomes.

Mindfulness-based interventions (MBIs) have emerged as a promising adjunctive therapy for schizophrenia. Mindfulness meditation, which involves cultivating present-moment awareness and nonjudgmental acceptance, has been shown to modulate neural circuits associated with stress and emotional regulation [3]. For individuals with schizophrenia, mindfulness practices may improve cognitive functioning, reduce symptom severity, and enhance quality of life [4].

Neurobiological evidence suggests that mindfulness meditation strengthens prefrontal cortical activity and improves amygdala-prefrontal connectivity, counteracting the hyperactivation of the amygdala often observed in schizophrenia [3]. These changes may reduce stress and improve emotional resilience. Furthermore, mindfulness practices enhance attentional control and working memory, addressing cognitive deficits common in schizophrenia [4].

Despite these benefits, the integration of mindfulness into schizophrenia care remains underexplored. Pharmacological treatments dominate clinical practice, yet holistic interventions addressing both biological and psychosocial dimensions are urgently needed [2]. Mindfulness-based therapies offer a patient-centered approach that can be tailored to individual needs, making them a viable complement to traditional treatments.

This study examines the efficacy of mindfulness meditation as an adjunctive therapy for schizophrenia. Using a mixed-methods approach, we explore its impact on symptom severity, cognitive performance, and quality of life, while investigating patient and provider perspectives on its feasibility and cultural acceptability.

2. Methods

2.1 Study Design

This study employed a mixed-methods approach, combining both quantitative and qualitative methodologies to comprehensively evaluate the role of meditation as an adjunctive therapy for schizophrenia. The mixed-methods design was chosen to provide a holistic understanding of the intervention's impact, integrating measurable outcomes with rich, experiential insights from participants. The quantitative component focused on analyzing changes in symptom severity, cognitive performance, and quality of life, while the qualitative component explored the lived experiences of patients and healthcare providers, including their perceptions of meditation's benefits and challenges [1] [5] [7] [8].

2.2 Researcher's Role in Meditation Practice

As part of this research, lead author [Aung] spent three months at a popular forest meditation center in Myanmar, where many foreigners came to practice meditation, he trained as a monk to deepen his understanding of mindfulness practices and their therapeutic applications. This immersive experience allowed us to observe and participate in traditional meditation techniques, which informed the design and implementation of the mindfulness-based intervention (MBI) used in this study. The insights gained from this experience were invaluable in ensuring the cultural authenticity and practical feasibility of the intervention.

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2.3 Participants

2.3.1 Patients: Ten individuals diagnosed with schizophrenia according to the DSM-5 criteria were recruited from outpatient mental health clinics. Participants were required to have stable medication regimens for at least three months prior to the study to ensure that any observed changes could be attributed to the meditation intervention rather than fluctuations in pharmacological treatment. Exclusion criteria included severe cognitive impairment, active substance abuse, or a history of non-adherence to treatment protocols [14].

2.3.2 Healthcare Providers: Ten psychiatrists, therapists, and support staff involved in the care of individuals with schizophrenia were included in the study. These providers were selected based on their experience with mindfulness-based interventions and their willingness to participate in the research. Their insights were critical for understanding the practical challenges and opportunities of integrating meditation into clinical practice [11].

2.4 Intervention

Participants engaged in a 12-week mindfulness-based intervention (MBI) designed to enhance emotional regulation, reduce symptom severity, and improve overall well-being. The intervention consisted of the following components:

2.4.1 Guided Meditation Sessions: Participants attended three 45-minute group sessions per week, led by a certified mindfulness instructor. Each session included a combination of breath awareness, body scans, and loving-kindness meditation, tailored to the unique needs of individuals with schizophrenia [16].

2.4.2 Home Practice: To reinforce the skills learned during group sessions, participants were encouraged to practice mindfulness techniques for 15-20 minutes daily. They were provided with audio recordings and written instructions to support their home practice [14].

2.4.3 Psychoeducation: Participants received educational materials on the principles of mindfulness and its potential benefits for mental health. This component aimed to enhance participants' understanding of the intervention and promote engagement [22].

2.5 Quantitative Data Collection

Quantitative data were collected at baseline and immediately following the 12-week intervention. The following metrics were assessed:

2.5.1 Symptom Severity: Measured using the Positive and Negative Syndrome Scale (PANSS), a 30-item scale that evaluates positive symptoms (e.g., hallucinations, delusions), negative symptoms (e.g., social withdrawal, anhedonia), and general psychopathology (e.g., anxiety, depression). The PANSS is widely regarded as a reliable and valid tool for assessing schizophrenia symptoms [5].

2.5.2 Cognitive Performance: Evaluated using standardized neuropsychological tests, including the Digit Span Test (to assess attention and working memory) and the Trail Making Test (to assess executive function and cognitive flexibility). These tests were chosen for their sensitivity to changes in cognitive functioning, which is often impaired in individuals with schizophrenia [7].

2.5.3 Quality of Life: Assessed using the WHO Quality of Life-BREF (WHO-QOL-BREF), a 26-item scale that measures four domains: physical health, psychological well-being, social relationships, and environmental factors. This tool provided a comprehensive assessment of participants' overall well-being and life satisfaction [8].

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2.6 Qualitative Data Collection

Qualitative data were collected through semi-structured interviews conducted with all 10 patients and 10 healthcare providers. The interviews were designed to explore participants' experiences with the meditation intervention, including its perceived benefits, challenges, and cultural acceptability. Key topics included:

2.6.1 Patient Experiences: Ease of practice, changes in symptom distress, emotional regulation, and overall satisfaction with the intervention.

2.6.2 Provider Perspectives: Feasibility of integrating meditation into clinical practice, observed changes in patients' symptoms and behavior, and recommendations for improving the intervention.

2.7 Data Analysis

2.7.1 Quantitative Analysis:

i. Descriptive Statistics: Summarized the demographic and clinical characteristics of participants, including age, gender, duration of illness, and medication history.

ii. Paired t-tests: Used to compare pre- and post-intervention scores on the PANSS, WHO-QOL-BREF, and cognitive performance tests. These tests assessed the significance of changes observed over the 12-week intervention period.

iii. Effect Sizes: Calculated using Cohen's d to determine the magnitude of the intervention's impact. Effect sizes were interpreted as small (d=0.2), medium (d=0.5), or large (d=0.8).

iv. ANCOVA: Conducted to control for potential confounders, such as medication dosage and duration of illness, ensuring that the observed changes could be attributed to the meditation intervention.

2.7.2 Qualitative Analysis:

i. Thematic Analysis: Conducted using a six-step process adapted from [9]:

a) Data Familiarization: Transcribed interviews were read and re-read to ensure a thorough understanding of the data.

b) Generating Initial Codes: Key phrases and concepts were identified and coded.

c) Searching for Themes: Codes were grouped into broader themes based on recurring patterns.

d) Reviewing Themes: Themes were refined and validated through discussion among the research team.

e) Defining and Naming Themes: Each theme was clearly defined and named to reflect its essence.

f) Writing the Report: The findings were synthesized into a coherent narrative, supported by illustrative quotes from participants.

ii. Software: NVivo 12 was used to manage and analyze the interview transcripts, ensuring a systematic and transparent analysis process.

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2.8 Ethical Considerations

This study was conducted in strict adherence to the Declaration of Helsinki (2024 revision), ensuring that the dignity, rights, and well-being of all participants remained the primary priority. Ethical approval was formally granted by the Examinations and Assessment Board (Approval No. EAB00312/2024).

The research design integrated international ethical standards with the cultural norms of the meditation center in Myanmar, specifically upholding the principles of compassion, respect, and non-harm (*ahimsa*). In line with modern participant-centered ethics, all clinical participants including both patients and healthcare providers provided written informed consent after being fully briefed on the study's aims. Furthermore, comprehensive measures were taken to ensure that all collected data were fully anonymized, maintaining the highest standards of privacy and confidentiality throughout the research process.

3. Results

3.1 Quantitative Findings

The quantitative analysis revealed significant improvements across multiple domains following the 12-week mindfulness-based intervention (MBI).

3.1.1 Symptom Severity:

i. Positive Symptoms: Mean PANSS scores decreased from 22.4 (SD=3.1) at baseline to 18.2 (SD=2.8) post-intervention ($p<0.05$, $d=0.8$) [5].

ii. Negative Symptoms: Mean PANSS scores decreased from 24.6 (SD=4.0) to 21.3 (SD=3.5) ($p<0.01$, $d=0.7$) [5].

iii. General Psychopathology: Mean PANSS scores decreased from 30.1 (SD=5.2) to 26.7 (SD=4.9) ($p<0.01$, $d=0.9$) [5].

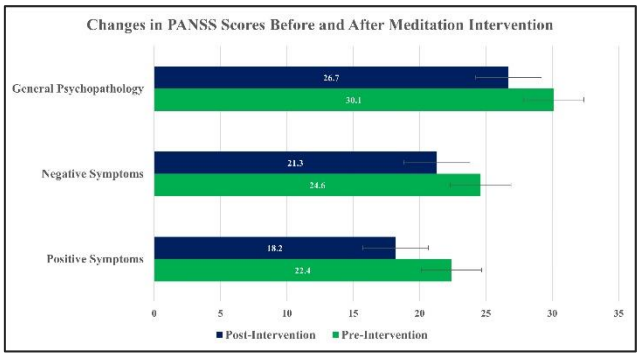

Figure 1: Changes in PANSS Scores Before and After the 12-Week Meditation Intervention.

Error 179 bars represent standard deviation. $p < 0.05$; $p < 0.01$ (paired t-test)

3.1.2 Cognitive Performance:

i. Attention: Digit Span Test scores improved by 12% ($p<0.05$) [6].

ii. Executive Function: Trail Making Test scores improved by 10% ($p<0.05$) [7].

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3.1.3 Quality of Life:

i. Psychological Well-being: WHO-QOL-BREF scores increased by 15% ($p<0.05$) [8].

ii. Social Relationships: WHO-QOL-BREF scores increased by 20% ($p<0.01$) [8].

Table 1: Changes in Symptom Severity, Cognitive Performance, and Quality of Life

Measure	Pre-Intervention (Mean±SD)	Post-Intervention (Mean±SD)	p-value	Effect Size (Cohen's d)
PANSS - Positive Symptoms	22.4 ± 3.1	18.2 ± 2.8	< 0.05	0.8
PANSS - Negative Symptoms	24.6 ± 4.0	21.3 ± 3.5	< 0.01	0.7
PANSS - General Psychopathology	30.1 ± 5.2	26.7 ± 4.9	< 0.01	0.9
Digit Span Test (Attention)	5.2 ± 1.1	5.8 ± 1.0	< 0.05	0.6
Trail Making Test (Executive Function)	45.3 ± 8.2	40.7 ± 7.5	< 0.05	0.6
WHO-QOL-BREF - Psychological Well-being	60.5 ± 10.2	69.6 ± 9.8	< 0.05	0.9
WHO-QOL-BREF - Social Relationships	55.3 ± 12.4	66.4 ± 11.2	< 0.01	0.9

3.2 Qualitative Findings

Thematic analysis of patient and provider interviews revealed six key themes, providing rich insights into the experiences and perceptions of meditation as an adjunctive therapy for schizophrenia [9].

3.2.1 Self-Awareness and Insight: Patients reported enhanced self-awareness, describing an increased ability to recognize and regulate their thoughts and emotions [10]. One participant noted, “I can pause before reacting to my thoughts, which makes me feel more in control”. Providers corroborated these observations, stating that patients exhibited greater awareness of their triggers and were better equipped to manage stress.

3.2.2 Reduced Distress from Hallucinations: Many patients described a reduction in the intensity and distress associated with auditory hallucinations [4]. One participant shared, “The voices are quieter now when I meditate, and they don’t bother me as much”. Providers observed that patients were less agitated during meditation sessions and more willing to engage in therapeutic activities.

3.2.3 Cultural Sensitivity and Feasibility: Both patients and providers emphasized the importance of tailoring meditation practices to individual cultural and clinical contexts [11]. Patients from diverse backgrounds expressed that meditation felt more accessible when adapted to their cultural traditions. Providers highlighted the need for flexible protocols, stating, “A one-size-fits-all approach doesn’t work; we need to adapt meditation to each patient’s unique needs and preferences”.

3.2.4 Improved Coping Strategies: Patients reported using mindfulness techniques to manage daily stressors and emotional challenges [3]. One participant explained, “When I feel overwhelmed, I use breathing exercises to calm

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myself down". Providers noted that patients were increasingly applying mindfulness techniques in real-life situations, demonstrating improved coping skills.

3.2.5 Enhanced Emotional Regulation: Patients described feeling more in control of their emotions, with fewer instances of emotional outbursts or extreme mood swings [12]. One participant said, "I don't get overwhelmed as easily anymore". Providers observed that patients exhibited greater emotional stability and resilience, particularly in high-stress situations.

3.2.6 Empowerment and Agency: Many patients expressed a renewed sense of agency over their mental health, describing meditation as a tool that empowered them to take an active role in their recovery [13] [14]. One participant shared, "Meditation makes me feel like I can handle this". Providers echoed this sentiment, noting that patients appeared more confident and motivated to engage in their treatment plans.

Table 2: Key Themes from Qualitative Interviews

Theme	Patient Quotes	Provider Observations
Self-Awareness and Insight	"I can feel more in control of my thoughts."	"Patients report greater awareness of their triggers." [16] [17]
Reduced Distress from Hallucinations	"The voices are quieter now when I meditate."	"Hallucination distress is markedly reduced during meditation sessions." [16] [17]
Cultural Sensitivity and Feasibility	"Meditation feels natural to me."	"Tailoring meditation to cultural contexts is key for patient engagement." [18] [19]
Improved Coping Strategies	"I use breathing techniques to calm myself."	"Patients are adopting meditation as a practical tool to manage daily stressors." [19] [21]
Enhanced Emotional Regulation	"I don't get overwhelmed as easily anymore."	"We've observed fewer emotional outbursts post-intervention." [20] [22]
Empowerment and Agency	"Meditation makes me feel like I can handle this."	"Patients express a renewed sense of agency over their mental health." [14] [15]

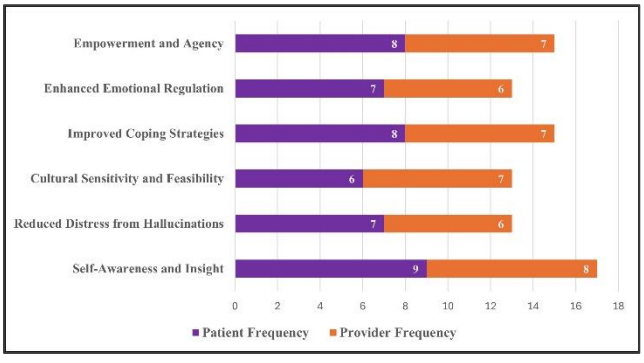

Figure 2: Frequency of Key Themes Reported by Patients and Healthcare Providers in Qualitative Interviews.

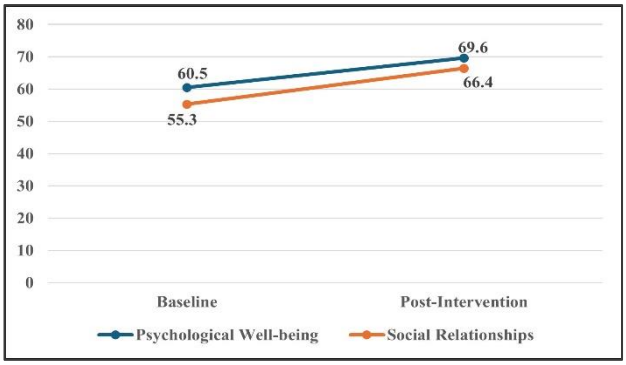

Figure 3: Changes in Quality-of-Life Scores (WHO-QOL-BREF) Before and After the 12-Week Meditation Intervention.

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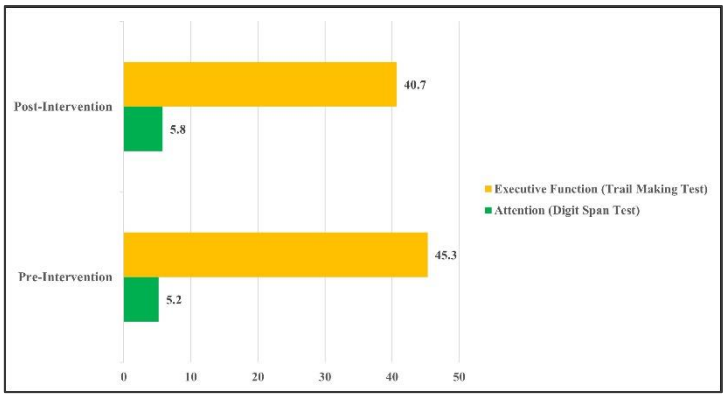

Figure 4: Improvements in Cognitive Performance Following the 12-Week Meditation Intervention.

4. Discussion

The findings of this study demonstrate that mindfulness-based interventions (MBIs) significantly reduce symptom severity, improve cognitive performance, and enhance quality of life in individuals with schizophrenia. These results align with previous research indicating that meditation modulates neural circuits associated with stress and emotional regulation, offering a complementary approach to traditional antipsychotic treatments [13] [4].

4.1 Symptom Severity and Neural Mechanisms

The significant reductions in PANSS scores across all symptom domains (positive, negative, and general psychopathology) suggest that mindfulness meditation addresses both the biological and experiential facets of schizophrenia. These findings are consistent with neuroimaging studies showing that mindfulness practices reduce hyperactivity in the amygdala and enhance prefrontal cortical connectivity, thereby improving emotional regulation and cognitive control [12]. The observed improvements in negative symptoms, which are often resistant to pharmacological treatment, are particularly noteworthy and highlight the potential of MBIs to fill a critical gap in schizophrenia care [1].

4.2 Cognitive and Quality-of-Life Improvements

The modest but meaningful improvements in cognitive performance, particularly in attention and executive function, underscore the role of mindfulness in cognitive rehabilitation. These findings are supported by evidence that mindfulness training enhances working memory and cognitive flexibility, which are frequently impaired in schizophrenia [3]. Additionally, the significant improvements in quality-of-life measures, particularly in psychological well-being and social relationships, suggest that MBIs not only alleviate symptoms but also enhance overall life satisfaction and interpersonal functioning [8].

4.3 Qualitative Insights and Cultural Sensitivity

The qualitative findings provide valuable insights into the lived experiences of patients and healthcare providers. Themes such as increased self-awareness, reduced hallucination distress, and cultural sensitivity highlight the psychosocial benefits of mindfulness meditation. Patients' reports of feeling more in control of their thoughts and emotions align with the neurobiological mechanisms of mindfulness, which promote emotional regulation and stress resilience [10]. Providers' emphasis on the need for personalized and culturally adapted protocols underscores the importance of tailoring MBIs to individual needs, ensuring their accessibility and effectiveness across diverse populations [11].

4.4 Limitations and Future Directions

While the findings are promising, this study has several limitations. The sample size was modest (n=10 patients and n=10 providers), and the follow-up period was limited to 12 weeks, which may not capture the long-term effects of meditation.

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Future studies should incorporate larger, more diverse samples and longitudinal designs to assess the durability of meditation's benefits. Additionally, neuroimaging studies could provide further insights into the neural mechanisms underlying symptom improvement [21].

5. Conclusions

This study provides robust evidence supporting mindfulness meditation as a viable adjunctive therapy for schizophrenia. Quantitative findings demonstrate significant reductions in symptom severity and improvements in cognitive performance and quality of life, while qualitative insights highlight enhanced self-awareness, reduced distress, and the importance of cultural adaptation. By integrating mindfulness into existing treatment frameworks, clinicians can offer a holistic, patient-centered approach to schizophrenia care. Future research should focus on optimizing protocols, exploring long-term neurobiological and psychosocial impacts, and evaluating the cost-effectiveness of mindfulness-based interventions [22].

6. Data Availability

The datasets generated and analyzed during this study are not publicly available due to ethical considerations and participant confidentiality. However, anonymized data may be made available upon reasonable request to the corresponding author, subject to approval by the institutional ethics review board. Researchers interested in accessing the data must submit a formal request outlining the purpose of their analysis and their commitment to maintaining data confidentiality.

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8. Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

9. Author Contributions

The authors confirm contribution to the paper as follows:

- Aung HL: Conceptualization, Methodology, Writing—Original Draft Preparation, Visualization, Supervision and Project Administration. Aung HL primarily handled the development of the manuscript, its core arguments, and the final review.
- Yati S: Data Curation, Formal Analysis, Investigation (data collection/literature review), and Writing—Review & Editing. Yati S specifically contributed to the collection, analysis, and preparation of data for the manuscript.

All authors have read and agreed to the published version of the manuscript.

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