The Effectiveness of Therapy Administered by Mental Health Nurses (TKN) as an Intervention to Alleviate Hallucination Symptoms among Patients with Schizophrenia in Tasikmalaya City, Indonesia

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ABSTRACT

Background. In the context of acute psychiatric care characterized by severe hallucinatory symptoms, providing timely and effective interventions poses challenges. Therapy administered by Mental Health Nurses (TKN) emerges as a promising solution to comprehensively address these acute symptoms. This therapeutic approach is designed to alleviate hallucination symptoms during the acute phase.

Objectives. This study aimed to investigate the effectiveness of Therapy administered by Mental Health Nurses (TKN) as an intervention tailored for individuals facing acute hallucinatory challenges. The overarching goals include exploring the therapeutic dimensions of the intervention, assessing the potential for tailored interventions based on demographic factors, and translating findings into practical implications for mental health professionals.

Methods. This study used a quasi-experimental design with a one-group pre-post-test structure. A total of 117 participants diagnosed with schizophrenia from outpatient psychiatric wards were selected in community setting, excluding individuals with concurrent mental retardation to maintain sample homogeneity. Data collection, conducted over two months from July to August 2023, included a pre-test assessment before any intervention to establish baseline hallucinatory symptoms. Therapy by Mental Health Nurses (TKN) was administered over two weeks, consisting of four 30- to 45-minute sessions for each participant. After each session, participants underwent reassessment for hallucinatory symptoms, totaling five assessments. Psychotic Syndrome Rating Scale (PSYRAT) was used to measure hallucination scores. The data analysis employed paired t-tests for baseline and post-intervention scores within a two-week period. A Repeated Measures Analysis of Variance (ANOVA) assessed the effect of interventions on hallucination scores, with age, gender, and adherence status as factors. Post hoc analyses, including pairwise comparisons, identified specific subgroup differences and assessed the time effect within the same group.

Results. The study cohort primarily consisted of adults (90.6%), maintaining a balanced gender distribution with 51.3% males and 48.7% females. A substantial portion had low educational backgrounds (59%), and the majority were unemployed (87.2%), with family members serving as the predominant primary caregivers (87.2%). Regarding medication adherence, over half adhered to the prescribed regimen (52.1%). Results demonstrated an improvement in hallucination symptoms for adolescents and the elderly compared to adults. While gender and adherence status did not individually influence symptoms significantly, age category emerged as a significant contributing factor ($F = 3.991$, $p = 0.021$). Interaction effects emphasized the substantial influence of time on symptom shifts over the intervention ($F = 24.164$, $p < 0.001$). Particularly, the

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mean difference of 4.636 ($p < 0.001$) from Time 1 to Time 5 signified a substantial decrease in hallucination scores, highlighting the cumulative impact of the therapy. These findings underscore the effectiveness of Therapy administered by Mental Health Nurses (TKN) across diverse demographic factors, providing valuable insights for tailored interventions in psychiatric emergencies.

Conclusion. Therapy administered by Mental Health Nurses (TKN) demonstrates effectiveness in reducing schizophrenia symptoms, especially among adolescents and the elderly. The impact of time on the intervention's effectiveness is notable, with a cumulative effect observed over the intervention period. Sustained and consistent engagement with the therapy leads to more substantial improvements in hallucination symptoms. Therefore, tailored interventions considering age are crucial for optimal effectiveness. This understanding enables practitioners to optimize the therapy schedule, aligning it with the natural progression of symptom alleviation.

Keywords: hallucination, symptoms, therapy, mental health, nurses, community setting

INTRODUCTION

Mental disorders are conditions characterized by changes in emotions, thoughts, feelings, and behaviors that disrupt life cycles and social processes. In Indonesia, the incidence of mental disorders was 7 per 1000 people in 2018, a substantial increase from 1.7 per 1000 people in 2013, representing a 78% rise over five years.[1,2] Within communities, mental disorders are categorized into emotional and severe mental disorders, with schizophrenia being one of the most prevalent diagnoses. Schizophrenia, a severe mental disorder, impacts not only the patients but also their families. The effects on schizophrenia patients encompass all aspects of their lives, including physical, psychological, social, and economic burdens on the family. The lifelong treatment of schizophrenia becomes an additional burden for patients and their families, exacerbated by the negative stigma encountered in society.[3]

Hallucinations are among the most common symptoms experienced by schizophrenia patients, affecting 70-80% of them.[4] According to the American Psychiatric Association, auditory hallucinations are the most frequent, occurring in 70% of cases, followed by visual hallucinations in 20%, and other types in 10%.[5] Additionally, 20% of patients experience both visual and auditory hallucinations post-treatment; hallucination symptoms persist and are prone to recurrence, leading to social disruption.[6] Behaviors resulting from hallucinations cause concern for the family or caregiver.[7,8]

Post-treatment, patients with hallucinations are typically monitored through monthly follow-ups if their condition is stable, while home visits for evaluating hallucination symptoms in the community under health centers have been less optimal. The majority of hallucination symptoms occur due to medication discontinuation and inadequate family caregiving at home. Research shows that more than half (52%) of patients have poor medication adherence. Reasons for non-adherence include societal stigma, frequent hospital visits, minimal belief in recovery, and lack of family support.[9] The experiences of patients and families lead to burdens that manifest as physical neglect, irritability, social withdrawal, and reduced productivity. Addressing these issues requires support that enhances positive aspects (increased understanding, empathy, strengthening bonds) and adaptive resources (acceptance, optimism, social support, and spiritual well-being).[10]

Given the above context, there is a need for interventions that involve community-based visits to provide care to patients and support their families through home visits. Research indicates that face-to-face approaches, home visits, and routine online contact can reduce stigma experienced by patients and families by 90%.[6,7,11]

This study utilized Stuart's Stress Adaptation Model as the theoretical foundation to develop the intervention. The model conceptualizes mental illness as a response to stressors that overwhelm an individual's adaptive capacity, emphasizing the interaction between biological, psychological, environmental, and socio-cultural factors.[12] Based on this framework, the intervention was designed to support adaptive responses and reduce symptoms of hallucinations among participants. Therapy administered by mental health nurses aimed to restore the balance between stress and coping through structured therapeutic communication and emotional support. The intervention focused on improving the individual's coping strategies, strengthening their social support system, and enhancing adaptive functioning—core principles of Stuart's model. This theoretical grounding provided a holistic and person-centered approach to guide both the assessment and implementation of the intervention.

This study aims to assess the effectiveness of nursing care interventions for hallucinating patients in the community through generalized mental health nursing therapy in managing post-hospitalization symptoms.

METHODS

Study Design

This study was a quasi-experimental inquiry employing a one-group pre-post-test structure.

Study Setting

This study was conducted in the Tasikmalaya community, West Java, Indonesia. Tasikmalaya was chosen due to its well-established community mental health services and collaborative outpatient psychiatric programs that support patients with schizophrenia in a community-based setting. The region has one of the highest outpatient caseloads in the province, with sufficient infrastructure and accessibility

to implement community-based interventions. Moreover, the researchers had established partnerships with local mental health professionals and healthcare centers, which facilitated participant recruitment, ethical approval, and intervention delivery. This setting reflects a typical Indonesian semi-urban community, making the findings applicable to similar populations.

Sample Size

The study involved 117 patients from Tasikmalaya in a community setting. This study used convenience sampling with the following inclusion criteria: selected based on a diagnosis of schizophrenia and age more than 18 years old. Individuals with concurrent mental retardation were excluded to ensure a more homogeneous sample.

The G-power analysis was conducted to assess the strength of the available sample size using the F test, Repeated Measures ANOVA, within-factors, with an effect size of 0.25, one group, and five-time measurements. The analysis results showed that with 117 participants, the statistical power (1-β probability of error) was 0.99% indicating that this research has sufficient power to detect significant effects.

Data Collection

In the participant selection phase of this non-randomized study, potential participants were chosen based on their medical diagnosis, ensuring a targeted focus on individuals with relevant psychiatric conditions. The researcher collaborated with the public health center and health cadres to access the targeted participants in their homes within subdistrict Purbaratu, Kahuripan, Cigeureung, Taman Sari, Kawalu of Tasikmalaya City. The data collection was conducted from July to August 2023. Before the initiation of any intervention, participants underwent a pre-test assessment designed to establish a baseline for their hallucinatory symptoms. A variety of measures and assessments, aligned with the study's specific objectives, were employed during this initial phase to assess the participants at baseline status.

Intervention

The study focused on applying Therapy administered by Mental Health Nurses (TKN), spanning two weeks. It involves a series of structured interventions aimed at managing hallucinations in patients, delivered by 18 mental health nurses over four sessions. The first session focuses on assessing the signs, symptoms, and causes of hallucinations, and introduces a technique called "dismissing hallucinations," where the patient is trained to actively reject or ignore them. The second session involves re-evaluating the patient's symptoms and teaching them to manage hallucinations through conversation, either with others or through self-talk, as a form of distraction. In the third session, the emphasis is on controlling hallucinations by engaging the patient in various activities that divert their attention. The final session highlights the importance of adhering to prescribed medications to manage symptoms effectively, while also monitoring any changes in the patient's condition.[13–15] This comprehensive approach integrates assessment, therapeutic techniques, and medication management to help patients gain better control over their hallucinations.

Each participant had four therapy sessions lasting 30 to 45 minutes one by one with the therapist in patient's home accompanied by health cadres and nurse from primary health care center. After each session, participants were reassessed for hallucinatory symptoms. Five assessments in total were conducted to gauge the intervention's effectiveness. The measurement of hallucination scores utilized the Psychotic Syndrome Rating Scale (PSYRAT), which was initially created and later modified. It underwent comprehensive validity and reliability assessments, resulting in an r value of 0.482 and a Cronbach's alpha of 0.7631. All assessments were conducted through face-to-face interviews by trained researchers using structured questionnaires.

Data Analysis

Data were analyzed according to the pre-specified analysis plan. No deviations from the planned data analysis procedures occurred. Appropriate statistical analyses, such as paired t-tests, were employed to compare baseline and post-intervention scores within a two-week period, examining each demographic factor independently. This approach allowed for a nuanced understanding of how Therapy administered by Mental Health Nurses (TKN), influenced hallucination scores across distinct subgroups. To comprehensively explore the impact of the interventions on hallucination scores within the single group, a Repeated Measures Analysis of Variance (ANOVA) was conducted, encompassing age, gender, and adherence status as between-subject factors. This statistical model facilitated an examination not only of the overall effectiveness of the interventions but also of potential variations in these effects based on gender and adherence status. Following the Repeated Measures ANOVA, post hoc analyses, including pairwise comparisons, were conducted to identify specific differences between subgroups and assess the time effect within the same group. These post hoc analyses played a crucial role in pinpointing significant variations in hallucination scores among different combinations of age category, and the impact of time on this score within the group. Integrating these factors into the statistical analyses provided a more comprehensive understanding of the intervention's impact on diverse subgroups, offering valuable insights for personalized and targeted therapeutic approaches in the context of community setting.

Ethical Considerations

Informed consent was obtained from all participants prior to data collection following the 2016 CIOMS Guidelines. As the study involved individuals diagnosed with schizophrenia in an outpatient community setting, participants were screened to ensure adequate cognitive capacity to understand

Table 1. Characteristics of Participants (n = 117)

Characteristic	Frequency (n)	Percent (%)
Age		
Adolescent	3	2.6
Adult	106	90.6
Elderly	8	6.8
Gender		
Male	60	51.3
Female	57	48.7
Education		
Low	69	59.0
High	48	41.0
Employed		
No	102	87.2
Yes	15	12.5
Primary Caregiver		
Self	10	8.5
Family	102	87.2
Institutional	5	4.3
Medication Adherence Status		
Adherence	61	52.1
Non-adherence	56	47.9

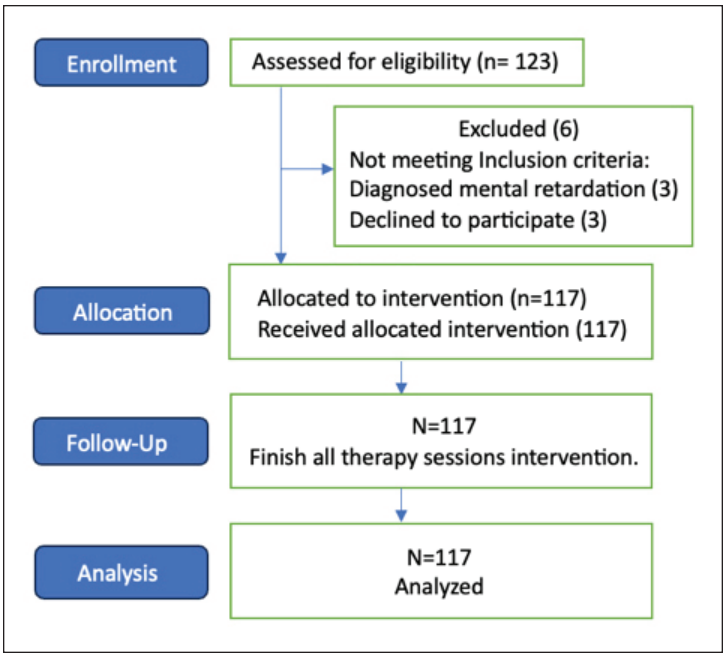

Figure 1. The study flow diagram.

Table 2. Baseline of Hallucination Symptoms (n=117)

Variable	Mean	Median	SD	Min- Max	95% CI
Total Hallucination Symptoms	11.96	12.00	4.14	4 – 25	11.20 – 12.72
Hallucination Symptoms Dimension					
Cognitive	2.43	2.00	1.03	0 – 5	2.24 – 2.62
Affective	2.39	2.00	1.06	0 – 5	2.20 – 2.58
Physical	1.82	2.00	1.15	0 – 5	1.60 – 2.03
Behavioral	3.19	3.00	1.13	1 – 5	2.98 – 3.40
Social	2.10	2.00	1.28	0 – 5	1.86 – 2.33

the study. Individuals with comorbid intellectual disability were excluded. The research team explained the study purpose, procedures, and participants' rights using simple, clear language. Family members or caregivers were invited to be present during the explanation to assist participants in decision-making, and written informed consent was obtained from the participants. The research procedures were conducted in accordance with the ethical standards under ethical approval number KP-KEPK/0173/2022 from the Health Research Ethics Committee, Politeknik Kesehatan Tasikmalaya.

RESULTS

This study included 117 respondents. The flow of participant recruitment and retention is presented in Figure 1.

The majority of participants in this study were adults aged 20 to 59 years old (n=106, 90.6%), male (n=60, 51.3%), and had low educational status (n=69, 59%). The majority of participants were being cared for by their families (n=102, 87.2%). More than half of the respondents adhered to their medication therapy (n=61, 52.1%) (Table 1).

The initial analysis of hallucination symptoms in this study indicates an average score of 11.96, suggesting a moderate level of hallucination tendencies, with a standard deviation of 4.14. Breaking down the specific dimensions, the cognitive dimension averages 2.43 (SD = 1.03), affective dimension averages 2.39 (SD = 1.06), physical dimension averages 1.82 (SD = 1.15), behavioral dimension averages 3.19 (SD = 1.13), and the social dimension averages 2.10 (SD = 1.28) (Table 2). A higher score on the instrument signifies more severe hallucination symptoms. The behavioral dimension emerges with the highest severity, indicating a more pronounced aspect of hallucination symptoms, followed by cognitive and affective dimensions.

Following the implementation of Therapy administered by Mental Health Nurses (TKN) among 117 patients diagnosed with schizophrenia, a reduction in hallucination symptoms was observed across multiple dimensions. The findings, as presented in Table 3 and Figure 2, depict a comprehensive analysis of the mean scores and standard deviations at different assessment time points.

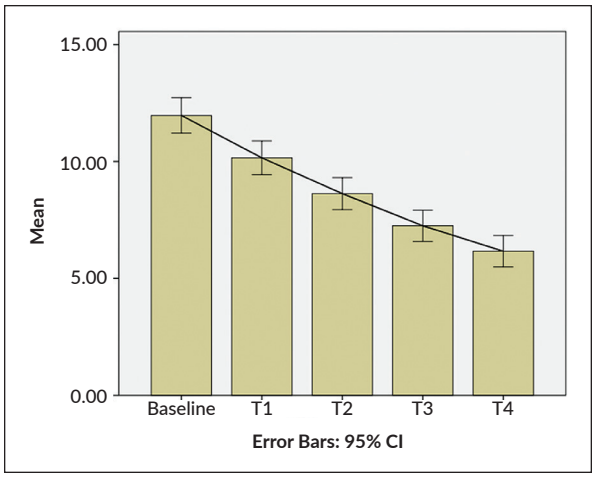

Figure 2. Graphic trend of hallucination symptoms reduction among patients with schizophrenia post-therapy administered by Mental Health Nurses (TKN) (N=117).

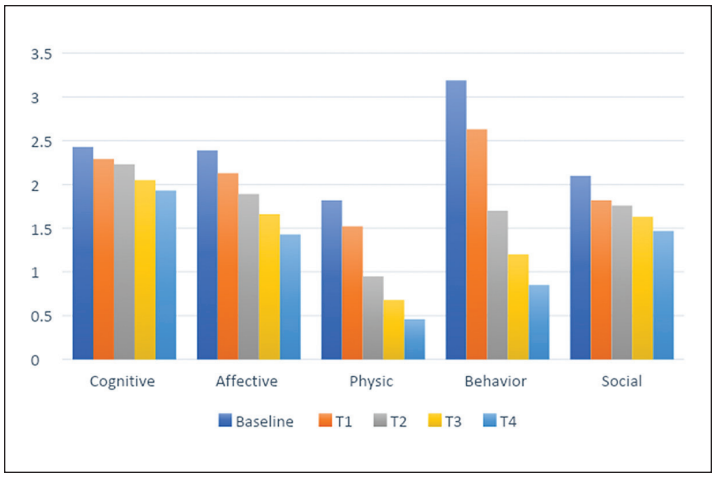

Figure 3. Graphic trend of reduction in hallucination symptoms across dimensions among patients with schizophrenia post-therapy administered by Mental Health Nurses (TKN) (N=117).

Table 3. Hallucination Symptoms Post Therapy Administered by Mental Health Nurses (TKN) among Patients with Schizophrenia (N=117)

Time Point Assessment	Hallucination Symptoms		Hallucination Symptoms Dimensions									
	Total Score		Cognitive		Affective		Physical		Behavior		Social	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Baseline	11.96	4.14	2.43	1.03	2.39	1.06	1.82	1.15	3.19	1.13	2.10	1.28
T1	10.15	3.96	2.29	1.06	2.13	1.04	1.52	1.07	2.63	1.16	1.82	1.21
T2	8.62	3.73	2.23	1.07	1.89	1.01	0.95	0.99	1.70	0.99	1.76	1.17
T3	7.24	3.64	2.05	1.10	1.66	1.02	0.68	0.90	1.20	0.90	1.63	1.12
T4	6.16	3.69	1.93	1.07	1.43	0.99	0.46	0.72	0.85	0.94	1.47	1.07

Lower score indicates reduction of symptoms

As Therapy administered by Mental Health Nurses (TKN) progressed through four assessment time points (T1 to T4), a consistent reduction in symptomatology was evident. At T1, the mean total score decreased to 10.15 (SD = 3.96), with cognitive symptoms at 2.29 (SD = 1.06), affective symptoms at 2.13 (SD = 1.04), physical symptoms at 1.52 (SD = 1.07), behavioral symptoms at 2.63 (SD = 1.16), and social symptoms at 1.82 (SD = 1.21)(Figure 3).

Following the positive changes observed after the first intervention session, subsequent assessments further underscored a consistent decline in symptom severity among patients undergoing Therapy administered by Mental Health Nurses (TKN). At T2, the mean total score exhibited a notable decrease, reaching 8.62 (SD = 3.73), indicating a continued improvement in overall hallucination symptoms. This reduction was sustained and became even more pronounced at T3, where the mean total score further decreased to 7.24 (SD = 3.64).

However, the most substantial reduction in symptom severity was evident at T4, with the mean total score reaching 6.16 (SD = 3.69). This marked improvement suggested a significant positive response to the continued implementation of Therapy Administered by Mental Health Nurses (TKN), highlighting its effectiveness in consistently alleviating hallucination symptoms over the course of the intervention. Upon detailed examination of hallucination symptom dimensions at T4, considerable improvements were observed across various aspects. Cognitive symptoms showed a mean of 1.93 (SD = 1.07), reflecting a substantial reduction. Affective symptoms demonstrated a mean of 1.43 (SD = 0.99), indicating a notable improvement in emotional experiences. Physical symptoms exhibited a mean of 0.46 (SD = 0.72), suggesting a considerable alleviation of physical manifestations. Behavioral symptoms displayed a mean of 0.85 (SD = 0.94), signifying positive changes in patients' actions. Social symptoms revealed a mean of 1.47 (SD = 1.07), indicating improvements in interpersonal aspects. These findings at T4 highlight the comprehensive impact of Therapy administered by Mental Health Nurses (TKN) on diverse dimensions of hallucination symptoms, reinforcing its efficacy

in fostering significant and multi-faceted improvements among individuals with schizophrenia.

Table 4 presents an analysis of the differences in mean scores for hallucination symptoms observed before and after a two-week intervention period (T2). This comparison encompasses baseline scores (T0) and scores obtained post-intervention. The calculated mean difference of 5.80, along with a standard deviation (SD) of 2.99 and standard error (SE) of 0.28, signifies a statistically significant increase. The 95% confidence interval (CI) with lower and upper bounds of 5.26 to 6.35 emphasizes the statistical importance of this observed difference. With a t-value of 20.96 and degrees of freedom (df) set at 116, a p-value of .000 further underscores the significance. The analysis distinctly reveals a substantial and statistically significant improvement in reducing hallucination symptoms following the two-week intervention.

The ANOVA results yield valuable insights into how gender, adherence status, age category, and their interactions influence hallucination symptoms over time (Table 5).

When examining the main effects, the influence of gender on hallucination symptoms does not reach statistical significance (F = 0.149, p = 0.700), suggesting a lack of discernible differences in symptom manifestation between genders (Figure 4).

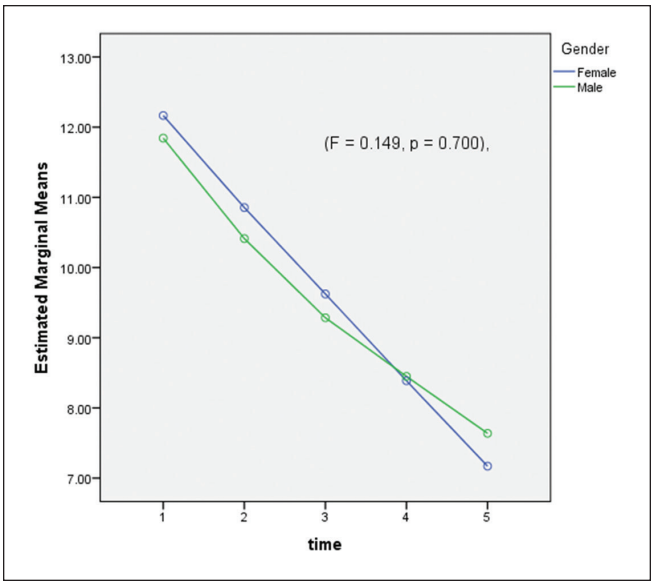

Figure 4. ***Hallucination Symptom Scores:*** Analyzing trends based on gender over time.

Table 4. Analysis of Mean Score Differences before (T0) and after Two-week (T2) Intervention on Hallucination Symptoms

Hallucination Symptoms Score	Paired Difference					t	df	*P*-value
	Mean Difference	SD	SE	95% CI				
				Lower	Upper			
Baseline (T0) – (T4)	5.80	2.99	.28	5.26	6.35	20.96	116	.000

Table 5. The Effects of Gender, Adherence Status, Age Category, and their Interactions, on Hallucination Symptom Score over Time during the Implementation of Therapy Administered by Mental Health Nurses (TKN)

Source of Variance	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F	*p*-value	Partial Eta-Squared
Between Subject						
Gender	8.637	1	8.637	.149	.700	.001
Adherence Status	72.668	1	72.668	1.252	.266	.012
Age Category	463.442	2	231.721	3.991	.021	.070
Gender * Adherence Status	.388	1	.388	.007	.935	.000
Gender * Age	132.732	2	66.366	1.143	.323	.021
Adherence Status * Age	359.108	2	179.554	3.093	.050	.055
Gender * Adherence Status* Age	35.379	1	35.379	.609	.437	.006
Within Subject (Repeated Measures)						
Time	197.178	1.880	104.880	24.164	.000	.186
Interaction Effect						
Gender * Time	4.527	1.880	2.408	.555	.564	.005
Adherence Status * Time	2.263	1.880	1.203	.277	.744	.003
Age * Time	26.377	3.760	7.015	1.616	.175	.030
Time * Gender * Adherence Status	1.347	1.880	.717	.165	.835	.002
Time * Gender * Age	12.173	3.760	3.237	.746	.554	.014
Time * Adherence Status * Age	8.041	3.760	2.138	.493	.730	.009
Time * Gender * Adherence Status * Age	7.259	1.880	3.861	.890	.407	.008
Error	864.965	199.284	4.340			

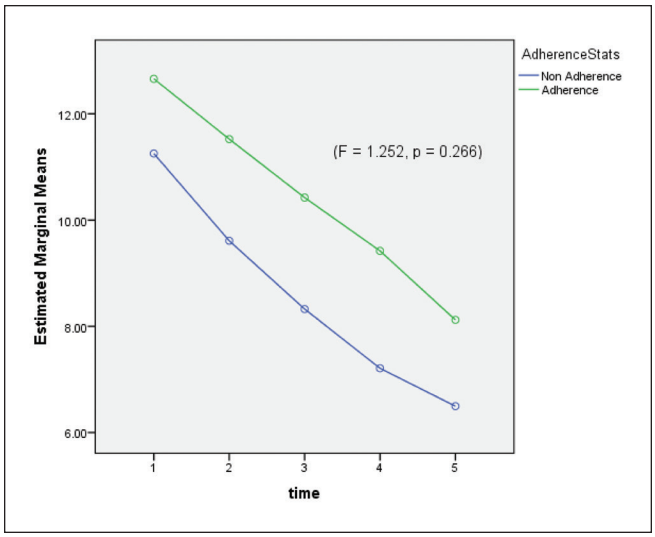

Figure 5. ***Hallucination Symptom Scores:*** Analyzing trends based on adherence status over time.

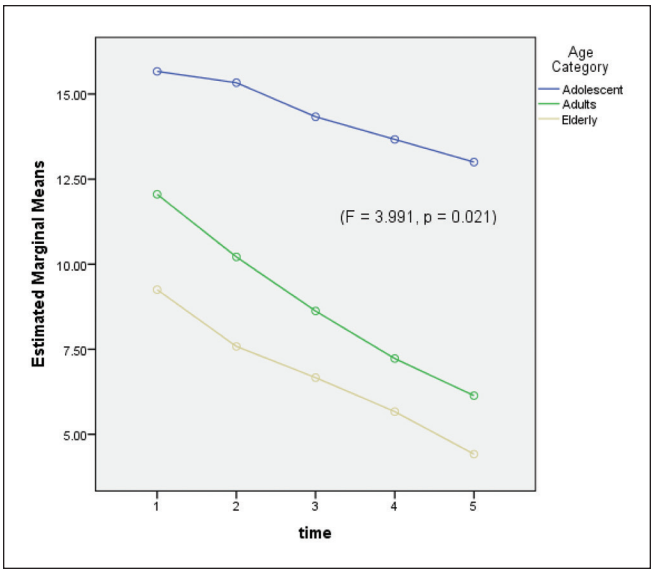

Figure 6. ***Hallucination Symptom Scores:*** Analyzing trends based on age category over time.

Table 6. Comparative Analysis of Mean Differences in Hallucination Scores across Age Categories during the Implementation of Generalized Hallucination Interventions

(I) Age Category	(J) Age Category	Mean Difference (I-J)	Std. Error	Sig.	95% CI for Difference	
					Lower Bound	Upper Bound
Adolescent	Adults	5.550	1.995	.019	.696	10.403
	Elderly	7.683	2.410	.006	1.822	13.545
Adults	Adolescent	-5.550	1.995	.019	-10.403	-.696
	Elderly	2.134	1.430	.416	-1.345	5.612
Elderly	Adolescent	-7.683	2.410	.006	-13.545	-1.822
	Adults	-2.134	1.430	.416	-5.612	1.345

Figure 5 illustrates that while the adherence group shows a higher hallucination score than the non-adherence group, the standalone impact of adherence status on variations in symptoms does not attain statistical significance ($F = 1.252$, $p = 0.266$).

On the other hand, the age category reveals a significant main effect ($F = 3.991$, $p = 0.021$), signifying notable variations in hallucination symptoms among distinct age groups, as illustrated in Figure 6. Additional analysis, presented in Table 6, conducts a comparative assessment of mean differences in hallucination scores across different age categories during the implementation of generalized hallucination interventions.

Key findings from this analysis demonstrate a statistically significant mean difference in hallucination scores between adolescents and both adults (5.550, $p = 0.019$) and the elderly (7.683, $p = 0.006$). These results indicate the effectiveness of the intervention in mitigating symptoms in these specific age groups. Conversely, the comparison between adults and adolescents ($p = 0.019$) reveals a substantial impact on both age groups, while the comparison between the elderly and adults ($p = 0.416$) shows no significant difference. These outcomes emphasize the varying effectiveness of the intervention across age categories, underscoring the importance of nuanced considerations in implementing generalized hallucination therapy.

Exploring interaction effects, the combined influence of gender and adherence status ($F = 0.007$, $p = 0.935$) appears non-significant, suggesting that the interplay between these factors does not significantly affect symptoms. Similarly, the interaction between gender and age is not statistically significant ($F = 1.143$, $p = 0.323$). However, a marginal significance is observed in the interaction between adherence status and age ($F = 3.093$, $p = 0.050$), hinting at a potential joint impact on hallucination symptoms. Yet, the three-way interaction involving gender, adherence status, and age remains non-significant ($F = 0.609$, $p = 0.437$) (Table 5).

Moving to within-subjects' effects, a highly significant main effect of time is evident ($F = 24.164$, $p < 0.001$), emphasizing substantial changes in hallucination symptoms over the measured time points.

In assessing Therapy administered by Mental Health Nurses (TKN) for managing hallucinations in acute care,

Table 7. Pairwise Comparisons of Mean Differences in Hallucination Scores across Different Time Points during Implementation of Generalized Hallucination Interventions

(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig	95% CI for Difference	
					Lower Bound	Upper Bound
1	2	1.365	.371	.004	.302	2.428
	3	2.550	.455	.000	1.247	3.853
	4	3.604	.597	.000	1.893	5.315
	5	4.636	.659	.000	2.746	6.527
2	1	-1.365	.371	.004	-2.428	-.302
	3	1.185	.250	.000	.467	1.902
	4	2.239	.415	.000	1.049	3.428
	5	3.271	.497	.000	1.846	4.696
3	1	-2.550	.455	.000	-3.853	-1.247
	2	-1.185	.250	.000	-1.902	-.467
	4	1.054	.319	.013	.140	1.968
	5	2.086	.422	.000	.876	3.297
4	1	-3.604	.597	.000	-5.315	-1.893
	2	-2.239	.415	.000	-3.428	-1.049
	3	-1.054	.319	.013	-1.968	-.140
	5	1.032	.255	.001	.300	1.765
5	1	-4.636	.659	.000	-6.527	-2.746
	2	-3.271	.497	.000	-4.696	-1.846
	3	-2.086	.422	.000	-3.297	-.876
	4	-1.032	.255	.001	-1.765	-.300

a compelling narrative unfolds as we analyze pairwise comparisons' statistical values (Table 7). A noteworthy trajectory emerges, revealing a significant and consistent increase in mean differences as participants progress through therapy sessions. The mean difference of 4.636 ($p < 0.001$) from Time 1 to Time 5 particularly highlights a substantial decrease in hallucination scores, emphasizing the cumulative impact of the therapy. These statistically meaningful results underscore the therapy's potential as a valuable intervention, portraying a trajectory of reducing hallucinatory symptoms in acute care settings.

Interaction effects with time, including gender * time ($F = 0.555$, $p = 0.564$), adherence status * time ($F = 0.277$, $p = 0.744$), age * time ($F = 1.616$, $p = 0.175$), and their combinations, are all non-significant. This implies that changes in symptoms over time do not significantly differ based on gender, adherence status, age, or their combinations (Table 5).

In conclusion, while gender and adherence status alone do not wield a significant influence on hallucination symptoms, age category emerges as a substantial contributing factor. The subtle interplays of interaction effect highlight potential dynamics, especially a slight interplay between adherence status and age. Importantly, the time-related aspect demonstrates a substantial influence, indicating significant shifts in symptoms over time, regardless of the presence of other influencing factors or their interactions.

DISCUSSION

Participant Characteristics

The study's findings provide valuable insights into the characteristics of participants, highlighting several demographic factors that may influence the baseline severity of hallucination symptoms. The majority of participants were adults aged 20 to 59 years (90.6%), male (51.3%), and with low educational status (59%). These demographic characteristics may have implications for the presentation and management of hallucination symptoms. For instance, being in the adult age group could correlate with more life stressors and responsibilities, potentially exacerbating mental health conditions. Additionally, a low educational status might limit access to mental health information and resources, affecting awareness and management of hallucination symptoms.

The influence of demographic characteristics on baseline hallucination tendencies is complex and multifaceted. Both age and gender can impact the type, severity, and coping mechanisms related to hallucinations. For instance, males and females may experience different types or severities of hallucinations, and adults might exhibit different patterns compared to adolescents or the elderly. Despite gender differences in risk levels for experiencing hallucinations, previous research indicates that factors such as masculinity, femininity, trauma, and past experiences, rather than gender alone, significantly influence hallucination experiences.[16]

Additionally, other studies suggest that women may have a higher potential to experience hallucinations in individuals with mental disorders.[17]

Furthermore, having a low educational background may hinder an individual's understanding of their condition and the available treatment options, potentially affecting their ability to manage symptoms and achieve optimal treatment outcomes.[18] Research has shown that higher educational attainment is associated with a reduced risk of developing schizophrenia by 4.2%.[6] Higher education enhances an individual's knowledge about health and increases awareness about preventive measures, which can contribute to better management of schizophrenia and overall mental health. This improved understanding can lead to more informed decision-making regarding treatment options and symptom management, ultimately leading to better outcomes for individuals with schizophrenia.

The high percentage of participants being cared for by their families (87.2%) underscores the vital role of family support in managing mental health conditions, particularly in settings where professional mental health services might be limited. Family involvement could provide emotional support, medication management, and daily care, all of which are crucial in improving patient outcomes. However, family caregiving may also place a significant burden on caregivers, influencing the overall caregiving quality and potentially impacting the patient's mental health. Moreover, the predominance of participants with low educational status suggests that families may need targeted education to better understand mental health conditions and effective caregiving strategies.[7,11,19]

More than half of the participants (52.1%) adhered to their medication therapy, indicating moderate levels of adherence in this population. Medication adherence is critical in managing hallucinations and other symptoms of mental health disorders. Factors such as family support, understanding of the condition, and consistent caregiving practices likely contribute to adherence levels. However, the remaining 47.9% of participants who did not adhere to their medication regimen may require additional support, such as psychoeducation or tailored interventions, to enhance adherence and improve health outcomes.

Baseline of Hallucination Symptoms

The initial analysis of hallucination symptoms reveals an average score of 11.96, indicating a moderate level of hallucination tendencies among participants, with a standard deviation of 4.14. This moderate baseline severity suggests that while hallucinations are a significant issue for participants, they are not yet at an extreme level. This presents an opportunity for effective intervention to manage symptoms and potentially improve outcomes before they worsen.

Examining the specific dimensions of hallucination symptoms, the behavioral dimension has the highest average score of 3.19 (SD = 1.13), indicating that hallucination-related behaviors are the most pronounced in this sample. This dimension captures observable actions and reactions related to hallucinations, such as talking to oneself or responding to non-existent stimuli. The elevated score suggests that these behaviors are particularly disruptive and noticeable, which can significantly affect an individual's daily functioning and social interactions. Additionally, research has shown that patients experiencing hallucinations often become preoccupied with the content of their hallucinations, leading to sleep disturbances. This disruption in sleep can impair concentration and further affect social interactions, compounding the overall impact on the individual's quality of life.[20] This finding underscores the importance of focusing on behavioral management strategies, such as distraction techniques and skills training, to help mitigate the disruptive effects of these behaviors in daily life.

The cognitive dimension, with an average score of 2.43 (SD = 1.03), and the affective dimension, with an average score of 2.39 (SD = 1.06), also show significant levels of severity. These dimensions reflect the participants' experiences of distorted thinking and emotional disturbances related to hallucinations. Cognitive distortions can exacerbate distress and complicate symptom management. Effective interventions, such as cognitive-behavioral therapy (CBT), could be beneficial for addressing these cognitive and emotional aspects by helping participants challenge and reframe distorted thoughts and manage their emotional responses.[21]

While the physical dimension has a lower average score of 1.82 (SD = 1.15) and the social dimension has an average score of 2.10 (SD = 1.28), these dimensions still contribute to the overall experience of hallucinations. The physical dimension relates to the bodily sensations and symptoms associated with hallucinations, whereas the social dimension pertains to the impact of hallucinations on social interactions. Addressing these aspects may involve integrating physical symptom management and improving social support systems.

Overall, these results highlight the need for comprehensive intervention strategies that target the behavioral, cognitive, and affective dimensions of hallucinations while also considering physical and social factors. Tailoring interventions to address these specific areas can help improve symptom management and enhance overall patient outcomes.

Longitudinal Assessment of Therapy Administered by Mental Health Nurses

The results of this study align with findings from other research on interventions aimed at managing hallucination symptoms in schizophrenia. Similar studies have reported that structured therapies administered by mental health professionals, such as cognitive-behavioral interventions, can lead to significant improvements in symptom severity.[22,23] For example, research has consistently shown that interventions focusing on cognitive and behavioral strategies help reduce the frequency and intensity of hallucinations by targeting the distorted thought patterns and behaviors associated with these symptoms.[24]

The Therapy administered by Mental Health Nurses (TKN) in this study appears to follow a comparable approach, with its multi-dimensional focus addressing various aspects of hallucinations. The significant reduction in symptoms across cognitive, affective, physical, behavioral, and social dimensions observed here reflects the therapy's effectiveness in providing a holistic approach to symptom management. This comprehensive impact is consistent with findings from studies that emphasize the importance of addressing multiple facets of hallucinations to achieve better overall outcomes.[5,25,26]

The effectiveness of TKN can be attributed to several key mechanisms. First, by focusing on behavioral aspects, TKN helps patients manage actions and reactions related to hallucinations, potentially reducing the frequency and severity of disruptive behaviors. Second, the therapy's emphasis on cognitive and affective dimensions likely contributes to improvements in patients' thought processes and emotional responses, which are critical for managing distorted perceptions and enhancing emotional stability. Additionally, by addressing physical symptoms and improving social interactions, TKN supports overall well-being and integration into daily life, further contributing to symptom reduction.

Moreover, similar interventions have demonstrated that regular, structured therapy sessions provide patients with ongoing support and reinforcement, which can enhance adherence and effectiveness. TKN's consistent application over the intervention period likely reinforced its benefits, leading to sustained improvements in hallucination symptoms. This aligns with findings from other studies where regular therapeutic engagement has been linked to better symptom management and overall treatment outcomes.

The results of this study support the effectiveness of TKN in managing hallucination symptoms and align with broader research on therapeutic interventions for schizophrenia. By targeting multiple dimensions of hallucinations and providing structured, ongoing support, TKN effectively contributes to reducing symptom severity and improving patients' quality of life. These findings underscore the value of integrated therapeutic approaches in managing complex mental health conditions and highlight the potential for similar interventions to achieve positive outcomes in diverse settings.

Analysis of Gender, Adherence Status, and Age on Hallucination Symptoms

In this study, neither gender nor adherence status significantly impacts hallucination symptoms. The lack of a significant effect of gender, with an F-value of 0.149 and a p-value of 0.700, suggests that hallucination severity does not differ markedly between males and females. This result is consistent with some research findings, such as those by Alliende et al., which also reported no substantial gender differences in hallucination symptoms among schizophrenia patients.[17] Gender, therefore, might not be a critical factor in the manifestation of hallucinations, indicating that both males and females experience similar symptom profiles.

Similarly, adherence status, despite a higher mean hallucination score in the adherence group, did not show a statistically significant effect ($F = 1.252$, $p = 0.266$). Which found that adherence to medication alone did not directly correlate with a reduction in hallucination severity. However, it is the quality of the treatment obtained that influences the treatment for the patient, both in terms of the quality of the medicine and the quality of the health services obtained.[9] This could suggest that while adherence is crucial for overall treatment, its effect on hallucination symptoms might be moderated by other factors, such as the type of therapy, individual differences, or the severity of the condition.

Impact of Age Categories

In contrast, the study highlights a significant impact of age on hallucination symptoms. With an F-value of 3.991 and a p-value of 0.021, age categories reveal notable differences in symptom severity. Adolescents show higher hallucination scores compared to adults and the elderly, with mean differences of 5.550 ($p = 0.019$) and 7.683 ($p = 0.006$), respectively. This finding is supported by research such as the study by Thom et al., which demonstrated that younger individuals often experience more severe and complex symptomatology, including hallucinations.[27] Adolescents may be more vulnerable to severe hallucinations due to developmental factors, cognitive immaturity, or less effective coping mechanisms. In contrast, comparisons between adults and the elderly in this study reveal no significant difference ($p = 0.416$), suggesting that hallucination symptoms may become relatively stable or less severe with age. This is consistent with findings by Larøi et al., which noted that elderly individuals often experience a reduction in the severity of hallucinations, potentially due to long-term exposure to treatment or natural progression of the disorder.[28] Hallucination symptoms that appear after the age of 40 years occur in only about 25% of the patient population with schizophrenia.[29] Other research states that the severity of hallucinations in patients is biased in measurement due to the incidence of dementia, Alzheimer's, and visual impairment due to decreased visual nerve function.[30,31]

Potential Joint Impact of Adherence Status and Age

The marginally significant interaction between adherence status and age ($F = 3.093$, $p = 0.050$) suggests that adherence status might have varying effects on hallucination symptoms across different age groups. This implies that the relationship between adherence and symptom severity could be moderated by age. For instance, adherence may be more crucial for symptom management in younger patients who might have less stable symptom profiles or be less consistent with their treatment. This finding aligns with research by Yao et al. which highlighted that the effectiveness of medication adherence could differ based on developmental stages and age-related factors.[32] Conversely, the non-significant three-way interaction involving gender, adherence status, and age

(F = 0.609, p = 0.437) indicates that the combined effects of these factors do not significantly influence hallucination symptoms. This suggests that while age and adherence status are important individually, their combined influence with gender does not add significant variance to the model.

Overall, while gender and adherence status alone do not significantly impact hallucination symptoms, age is a critical factor, with significant differences observed among adolescents, adults, and the elderly. These findings underscore the importance of age-specific interventions in managing hallucinations. The marginal significance of the interaction between adherence status and age suggests that tailored approaches considering age-related factors might enhance treatment outcomes. These results align with existing literature that emphasizes the need for nuanced, age-sensitive strategies in addressing hallucination symptoms.

Limitations of the Study

Despite the promising outcomes, this study has several limitations. First, the use of a one-group pre-test-post-test design limits the internal validity of the findings. Without a control group, it is difficult to rule out alternative explanations such as natural symptom fluctuations, placebo effects, or external influences. Although efforts were made to standardize the intervention and measurement procedures, the lack of comparison limits causal inference. Second, the assessment was conducted immediately after the intervention, which may capture only short-term effects. Participants' responses might reflect temporary improvements or heightened awareness due to recent engagement rather than sustained behavioral change. Future studies should include follow-up assessments to evaluate the long-term impact of the intervention. Third, the study relied heavily on self-reported measures, which are inherently subjective and may introduce response bias, potentially affecting the validity of the findings. Incorporating more objective clinical or behavioral assessments in future studies would enhance the reliability of the results. Lastly, the relatively short duration of the intervention may not have been sufficient to observe its enduring effects in alleviating hallucinations. Future research should aim to recruit a control group, extend the duration of the intervention, and incorporate long-term follow-up to strengthen the generalizability and sustainability of the findings.

CONCLUSION

The findings of this study reveal that Therapy administered by Mental Health Nurses (TKN) is effective in reducing hallucination symptoms among individuals with schizophrenia, with significant improvements observed in adolescents and the elderly compared to adults. Gender and adherence status did not exert significant individual effects on symptoms, emphasizing the impact of age categories. The element of time significantly influenced the changes in symptoms throughout the intervention period.

Recommendations

Recognizing the distinct responses observed among adolescents, adults, and the elderly emphasizes the need to tailor interventions to each age category, ensuring the optimization effectiveness of Therapy administered by Mental Health Nurses (TKN) across diverse demographic groups. Additionally, it is crucial to prioritize long-term monitoring for individuals undergoing the therapy. This extended observation period will facilitate a comprehensive assessment of sustained improvements and aid in identifying individuals who may require additional support beyond the initial intervention. To deepen our understanding of the therapy's mechanisms, further research is recommended, delving into specific factors influencing its effectiveness. This exploration could include an examination of additional demographic and clinical variables to refine and optimize the intervention for various patient profiles. Finally, adopting holistic approaches that integrate demographic factors, adherence status, and the temporal dimension is crucial. Developing comprehensive interventions tailored to individual needs ensures a more effective response to the complexity of hallucination symptoms during the community setting, post hospitalization phase.

Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

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