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Quality of Life Among Schizophrenia Patients Before and After Yoga: A Comparative Interventional Study

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Article history: Received 02 December 2024, Reviewed 10 March 2025, Accepted for publication 19 April 2025

ABSTRACT

Background: Aggression and sleeplessness are common symptoms of schizophrenia, which may make management and treatment difficult. Improving patient quality of life requires an understanding of these factors. According to previous research, there are inconclusive different levels of correlation between quality of life, insomnia and aggression in people with schizophrenia. Aim of our study is to see the quality of life along with insomnia and aggression among patients of schizophrenia before and after Yoga therapy.

Methods This study was designed as a before and after interventional study. It involved 120 schizophrenia patients aged 18-60 years of age, assessed using the (MOAS) Modified Overt Aggression Scale, sleep was assessed using the Insomnia Severity Index Scale (ISI), and quality of life was evaluated using the WHO Quality of life scale. Socio-demographic factors were also collected using researcher designed socio-demographic clinical data sheet. Data was extracted as per the scales used, continuous and categorical variables were extracted before yoga intervention and after 6 months of Yoga intervention. Data was analysed using SPSS 25. Descriptive statistics and paired t test were used to analyse the data.

Results Patients quality of life was found to be significantly improved after the yoga therapy. Insomnia was also improved among them after Yoga therapy. Our study revealed there is a significant reduction of aggressive symptoms assessed by MOAS

Conclusions This study emphasizes using yoga as an adjuvant therapy in schizophrenia patients along with pharmacotherapy for an overall better quality of life.

Keywords Yoga intervention · sleep disorder · Psychosis · Aggression · Insomnia

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How to cite this article

Nanda B, Mohanty R, Mishra SN, Lenka SS. Quality of Life Among Schizophrenia Patients Before and After Yoga: A Comparative Interventional Study. The Nigerian Health Journal 2025; 25(3):916 – 922. https://doi.org/10.71637/tnhj.v25i3.980

INTRODUCTION

Schizophrenia is a common severe mental disorder with a prevalence of 1% in the global population. It is a chronic, devastating, long-term mental condition marked by distortions in reality, thinking, cognition, and affect.[1] Patients with schizophrenia must take medication for a long period after diagnosis to control symptoms and maintain social functioning. Still, current treatments do not provide comprehensive improvements, with 70% requiring lifelong medicines.[2] A study reveals a median recovery rate of 13.5% from schizophrenia, despite significant treatment changes and medication research advancements.[3]

Quality of life is crucial for the efficacy of psychiatric practice and reflects the effectiveness of medication and psychological interventions. [4,5] Aggression and violence are significant societal issues, with aggression aimed at harming others motivated to avoid it, and violence being an extreme form of aggression causing severe physical harm.[6,7] People with schizophrenia who act aggressively and suffer from severe insomnia have a worse quality of life. The link between aggression and insomnia is reduced by quality of life, and in such individuals, aggressive behavior is affected by both insomnia and quality of life.[8]

The problem of sleep in schizophrenia patients also requires our attention. Research on sleep problems throughout the development of mental illnesses is essential.[9] Sleep disorders, including insomnia, are common in patients with chronic psychosis. Research on sleep problems in schizophrenia patients is crucial, as they are common in all phases of the illness and are associated with relapse, with 44% still experiencing comorbid sleep disturbances.[10]

It is essential to manage the aggression of the patient and sleep problems even when their schizophrenia is in the stable phase. By reducing violent behaviour and providing suitable treatment, risk factor analyses can help patients get into mainstream society. Schizophrenia patients often show few residual symptoms while on medications. There are studies which focus mostly on positive symptoms and negative symptoms but very few studies that address aggression, insomnia management with quality-of-life assessment after yoga intervention. Hence, we have seen the aggression and insomnia in schizophrenia patients before and after yoga therapy with assessment of quality of life.

METHODS

Design

This study was conducted in a tertiary health care institute of India, in department of Psychiatry with inpatient and outpatient facility. In the present study, schizophrenia patients treated with medications for more than one month whose PANSS score was <75 were given yoga therapy sessions with a follow-up assessment after 6 months. It was a single arm before and after interventional study.

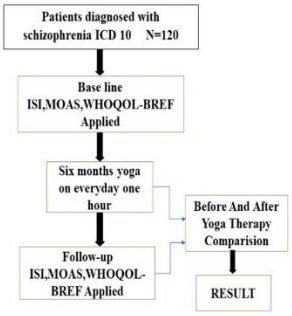

Fig I. Study design

Figure 1 examines the impact of yoga therapy on schizophrenia patients, with a sample size of 120 participants. The results were analyzed to evaluate the therapy's effectiveness.

Inclusion criteria

a) Both males and females aged 18 to 60 years who satisfied the criteria of Schizophrenia as per ICD-10.
b) Patients who have not had active symptoms for more than 4 weeks with a PANSS Score below 75%.
c) Those who will give informed consent

Exclusion criteria

a) Patients with any substance dependence except Nicotine and caffeine.
b) Major Neurological disorders.
c) Mental retardation.

Setting The study, conducted in a tertiary care center, aimed to provide intensive clinical support and rehabilitation services to patients with schizophrenia over one year i.e. January 2023 to December 2023**.**

Population and sample During the study period, we considered all the patients satisfying inclusion-exclusion criteria. Thus, the total number of patients considered

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for our study was 120 by conventional purposive sampling.

Procedure, variables and measurement instruments

All the patients were on oral antipsychotics with constant dosing without change of dose., PANSS, Insomnia Severity Index Scale (ISI), MOAS and WHO Quality of Life Scale were applied to the patients at the baseline. Yoga therapy was given to the patients for one hour every day by a Yoga Instructor for 15 days, and then they were told to continue the yoga therapy every day which was assessed by the Investigator through video call. After 6 months of yoga therapy again all these scales were applied to these patients data were analysed using SPSS-25.

Data collection

A study is being conducted with schizophrenia patients who were enrolled in both outpatient and inpatient services. The study assessed the efficacy of yoga as a treatment for schizophrenia patients taking medication, evaluating its effectiveness after a six-month intervention. The patients or their family members were consulted and the researchers explained the study thoroughly to ensure full comprehension before enrolment. After checking that all the necessary criteria for inclusion and exclusion criteria were met, patients were first admitted to the study group. Then psychological and sociodemographic measures including, ISI, MOAS, and WHO Quality of Life Scale were evaluated and compared as per our period after 6 months.

These were one-hour sessions that took place every day except Sunday a week for a total of twenty-four weeks. The course was customized to meet the needs of the participants according to their preliminary evaluations. . The yoga classes were led by instructors from our University. We hired a very skilled and experienced (PhD in yoga) yoga instructor from the University to conduct the classes. Among the Yoga there were OM chanting for 10 minutes, Sasankasana for 10 minutes, Anulom vilom for 10 minutes, Ustrasana for 5 minutes, Tadasana for 15 minutes, Sharing about Patients' experience for 5 minutes, Relaxation for 5 minutes. CLARIFY (CheckList stAndardising the Reporting of Interventions For Yoga was used to describe the yoga intervention).

Data analysis Data analysis was done using appropriate statistics such as paired t test and p value was set at <0.01.

Scales used

PANSS scale The positive and negative syndrome scale is a widely used tool in clinical trials to assess schizophrenia symptoms, with a five-factor system, with the negative symptom factor having the most stability and recycling itself several times more.

There are almost 30 items on the Positive and Negative Syndrome Scale (PANSS): 16 items on the overall Psychopathology Scale, 7 items on the Positive Scale, and 7 items on the Negative Scale. All the Positive and Negative Scales have probable score ranges from 7 to 49, while the General Psychopathology Scale includes a range between 16 to 112. In addition, the score on the Negative Scale is eliminated from the score on the Positive Scale for a Composite Scale.

The World Health Organization Quality of Life is a Questionnaire version, a five-point Likert scale, that assesses patients' current quality of life. A score below 6 indicated dissatisfactions, as the patient chose an answer representing dissatisfaction for at least one of the two questions.[11] Quality of life significantly influences psychiatric practice efficacy, medication effectiveness, and the prognosis of schizophrenic patients, requiring comprehensive research on its effectiveness.

In this study, engaging in physical activity emerged as a key protective factor for family caregivers' quality of life, positively influencing not only their physical well-being but also enhancing mental and social aspects.[12] The important link between physical activity and a better way of life has been proven by several research.[13] Physical activity helps with the physical and mental well-being of family caregivers. The general well-being and health of the entire family can be improved further by consisting of their care-dependent member in such activities.[14]

The insomnia severity index (ISI) is a questionnaire used to assess patients' sleep status. It consists of seven self-report items, scored from 0 to 4, with a score greater than 8 indicating severe insomnia.[15]

The manifest aggression scale (MOAS) is a widely used tool for assessing patients' aggression, including verbal, property, self-harm, and physical aggression.[16] It reflects different levels of risky behaviour in patients with mental disorders. MOAS has been shown to reflect different aggression levels in patients with mental disorders, with an ICC of 0.842 . [17] The cognitive function scoring can be categorized as 26-30: Normal cognition.18-25: Mild cognitive impairment.10-17:

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Moderate cognitive impairment. Under 10 points: Severe cognitive impairment.

Ethics approval and consent to participate

The Institutional Ethics Committee registered the study. Written Informed consent was included in the study, explaining the study design and aim before enrollment. Patients could terminate their participation at any time they desired without any justification. Confidentiality of information was assured, and they were informed that this study could be used for scientific publication without disclosing the identity of study participants.

RESULTS

Table I multiple variables with a sample size of 120 individuals who completed yoga therapy. The study reveals family structure type, age, gender, and employment status.

Table I Demographic data

Variable	category	Distribution (N=120)
Age (mean age ± SD)		35.5 ± 8.2
Gender	M	75 (62.5%)
	F	45(37.5%)
Employment	Employed	80 (66.67%)
	Unemployed	40 (33.33%)
Type of family	Nuclear	90 (75%),
	Joint	30 (25%)

Table 2 compares pair before and after yoga therapy. Paired t test was used to compare the variables

Table 2 presents the paired sample data from the paired t-test, evaluating various scales before (B/F) and after (A/F) an intervention. Symptom improvement was evident, as shown by a significant reduction in scores from 67.47±4.22 to 37.58±6.51 on the Positive and Negative Syndrome Scale (PANSS) (p = 0.000).

Following the intervention, physical health scores displayed substantial improvement, increasing from 45.82±6.29 to 74.03±5.97, with a mean difference of -28.21±7.44 (p = 0.000). A significant enhancement in mental health was noted in the psychological score, which rose from 37.55±5.86 to 71.13±3.85, with a mean difference of -33.58±6.44 (p = 0.000).

Table 2. PANSS score and domains of quality of life before and after intervention

Paired items	Scales used	Mean± SD	Mean difference	*P value
Pair 1	PANSS B/F	67.47±4.22	29.90	0.000
	PANSS A/F	37.58±6.51	±6.83	0
Pair 2	Physical Health B/F	45.82±6.29	-28.21	0.000
	Physical Health A/F	74.03±5.97	±7.44	0
Pair 3	Psychological Score B/F	37.55±5.86	-33.58	0.000
	Psychological Score A/F	71.13±3.85	±6.44	0
Pair 4	Social Relationship B/F	41.22±7.00	-29.14	0.000
	Social Relationship A/F	72.65±3.75	±7.36	0
Pair 5	Environmental B/F	45.58±7.50	-29.142	0.000
	Environmental Score A/F	74.72±5.32	±8.68	0

*Paired sample statistic, t test

Moreover, there was a significant boost in social interactions, which improved from 41.22±7.00 to 72.65±3.75, with a mean difference of -29.14±7.36 (p = 0.000). Enhanced quality of life and modification were reflected in the improved environmental ratings, which increased from 45.58±7.50 to 74.72±5.32, with a mean difference of -29.14±8.68 (p = 0.000).

All comparisons yielded consistent p-values of 0.000, indicating statistically significant improvements. Based on these findings, the intervention boosted social relationships, psychological well-being, environmental adaptation, overall health, and symptoms of schizophrenia. The notable increase in psychological scores signifies a major positive impact on mental health. Improvements in social and environmental factors suggest enhanced interpersonal engagement and daily functioning. Overall, the study demonstrates that the intervention supports the enhancement of multiple facets of well-being for individuals with schizophrenia.

The study found that an intervention significantly improved schizophrenia symptoms, overall health, psychological well-being, social relationships, and environmental adaptability in patients. The reductions in scores on the Positive and Negative Syndrome Scale (PANSS) and the increase in physical health scores indicated better physical well-being. The enhancements in social and environmental aspects pointed to improved daily functioning and interpersonal engagement. The intervention's effectiveness in benefiting multiple dimensions of well-being in schizophrenia patients is highlighted.

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Table 3. Insomnia Severity Index Comparison (*p*-value)

Category	Observed Before Yoga (N=120)	Observed After Yoga (N=120)
No Clinical Significance	17 (14.2%)	23 (19.2%)
Subthreshold Insomnia	64 (53.3%)	88 (73.3%)
Moderate Insomnia	25 (20.8%)	9 (7.5%)
Severe Insomnia	14 (11.7%)	0 (0%)

Table 3 shows the 120 participants' Insomnia Severity Index scores before and after a yoga session. The results indicate regular yoga significantly improves the quality of sleep. Participants with moderate insomnia decreased from 20.8% to 7.5%, while people with severe insomnia decreased from 11.7% to 0%. People with subthreshold insomnia also increased from 53.3% to 73.3%, while individuals with no clinical significance decreased from 14.2% to 19.2%. These outcomes indicate that yoga might be an effective approach for decreasing the severity of insomnia.

MOAS scale was used among schizophrenia participants before yoga and after yoga. It was found that in each patient aggression was reduced to minimal aggression level indicating highly significant reduction in aggression. Total score was 40. 0 was no aggression, 1-10 minimal aggression, 11-20 mild aggression, 20-30 moderate aggression, 30-40 severe aggression.

DISCUSSION

According to other research, Insomnia is a common symptom and predictor of psychotic relapse in schizophrenia patients. Harvey et al. found that sleeping disruptions frequently occur both before and after psychotic episodes, showing that insomnia may be a sign of psychotic relapse.[18] However, in this study, yoga intervention shows significant improvements in insomnia. A notable improvement in sleep quality after the intervention means severe insomnia scores and moderate scores were reduced.

Yoga improves sleep quality by increasing parasympathetic activity and reducing stress, promoting relaxation, and better sleep quality. Yoga's physical postures, breathing techniques, and meditation improve sleep latency and reduce night awakenings.[19] Schizophrenia patients can benefit significantly from the yoga capacity to balance the circadian rhythm and reduce hyperarousal because they frequently have irregular sleep and wake cycles.[20]

Duraiswamy et al. found a randomized controlled trial and showed that yoga practice led to Studies that have described that yoga can improve sleep quality and psychotic symptoms in schizophrenia patients.[21]. Yoga practice reduced insomnia, anxiety, and depression, and improved sleep latency and total sleep time. Yoga reduced insomnia severity and improved quality of life, Yoga also helped people with schizophrenia sleep longer and with sleep latency throughout 12 weeks, according to a study by Vancampfort.[22]

An improvement in mood as well as a decrease in dysfunction over the day were related to these improvements. Yoga significantly reduced insomnia severity in patients with chronic schizophrenia, improving quality of life and potentially having broader therapeutic effects beyond sleep. Earlier research has shown a strong correlation between increased sleep duration and better quality of life (QOL) for caretakers, highlighting the vital role that sleep plays in protecting QOL. A decrease in quality of life is strongly linked with poor sleep quality, which is frequently caused by insufficient sleep.[23]

Quality of life is an important indicator of the efficacy of psychiatric practice, as research on quality of life provides a comprehensive assessment of the effectiveness of both medication and psychological interventions. It has increasingly become a key quantify in evaluating the prognosis of patients with schizophrenia.[24]. This study shows the statistical significance (p-values < 0.00) describing the effectiveness of yoga significantly improved after yoga therapy was assessed by the WHO Quality of Life Scale. A study revealed both insomnia and quality of life related to aggression and that quality of life mediated the effect of insomnia on aggressive behaviour to some extent.[25] However, the current study found a significant reduction in aggressive behavior after yoga.

The mediating role of quality of life in the relationship between insomnia and aggression in stable schizophrenic patients was examined. Results showed that aggression was correlated with both insomnia and quality of life with quality of life functioning as a partial mediation factor between insomnia and aggressive behavior. Both medication and exercise participation were lower among patients who exhibited aggressive behaviors.[26]

The role of medication is to reduce aggression in schizophrenia patients, furthermore, as physical activity provides a means of releasing anger through exertion,

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encouraging these patients to practice yoga may help to reduce aggression.[27] The present study showed yoga practice reduces aggressive behaviour in patients with schizophrenia, contributing to an improved quality of life

Yoga effectively manages insomnia in schizophrenia patients, potentially reducing psychotic symptoms, emotional dysregulation, and aggression. Its non-pharmacological nature makes it an appealing option for patients struggling with antipsychotic side effects.

Limitations of the study

The trial of 120 patients receiving yoga intervention treatment for schizophrenia faced challenges due to initial reluctance. To address this, a senior counselor at our hospital provided free counseling and information about yoga's health benefits. However, logistical obstacles were a major issue for outpatient care. To overcome these challenges, the trial suggested bringing yoga closer to patients' homes, implementing shorter, more intensive training sessions, creating customized sessions for monthly follow-ups, hiring part-time or full-time instructors, and proactive follow-ups with patients to ensure regular yoga practice. Convenient sampling can be biased, hence randomized controlled trial can be tried in future studies.

CONCLUSION

The aggregation of insomnia in schizophrenia patients is a critical issue that worsens psychotic symptoms and overall quality of life. Yoga can improve sleep, and aggression and improve the quality of life, in schizophrenia patients. Yoga may help break the cycle of insomnia and psychosis, providing a holistic, non-pharmacological approach to schizophrenia management.

Declarations

Authors' contribution: Equal contribution

Conflict of interest: Authors declare no conflict of interest

Funding: Self-funded

Acknowledgement: The authors appreciate Prof. (Dr.) Sanghamitra Mishra, Dean of IMS & SUM Hospital, for her constant support. They are also thankful to Prof Manoj Ranjan Nayak, President of the Siksha O Anusandhan (Deemed to be University), for providing all the facilities.

REFERENCES

1. Jauhar S, Johnstone M, McKenna PJ. Schizophrenia. The Lancet. 2022 Jan 29;399(10323):473-86. https://doi.org/10.1016/S0140-6736(21)01730-X.
2. Lähteenvuo M, Tiihonen J. Antipsychotic polypharmacy for the management of schizophrenia: evidence and recommendations. Drugs. 202;81(11):1273-84.https://doi.org/10.1007/s40265-021-01556-4.
3. Jääskeläinen E, Juola P, Hirvonen N, McGrath JJ, Saha S, Isohanni M, Veijola J, Miettunen J. A systematic review and meta-analysis of recovery in schizophrenia. Schizophrenia bulletin. 2013;39(6):1296-306.https://doi.org/10.1093/schbul/sbs130.
4. Hoseinipalangi Z, Golmohammadi Z, Rafiei S, Kan FP, Hosseinifard H, Rezaei S, Ahmadi S, Ahmadi N, Raoofi S, Aghajani F, Dehnad A. Global health-related quality of life in schizophrenia: systematic review and meta-analysis. BMJ Supportive & Palliative Care. 2022;12(2):123-31. https://doi.org/10.1136/bmjspcare-2021-002936.
5. Mao Z, Tian L, Sun Y, Dong F, Wang C, Bo Q. Quality of life and its predictors in first-episode schizophrenia and individuals at clinical high-risk for psychosis. BMC psychiatry. 2023;23(1):793. https:// doi.org/10.1186/s12888-023-05303-9.
6. Allen JJ, Anderson CA. Aggression and violence: Definitions and distinctions. The Wiley handbook of violence and aggression. 2017;1:1-4.https://doi.org/10.1002/9781119057574.whbva001.
7. Tanskanen A, Tiihonen J, Taipale H. Mortality in schizophrenia: 30-year nationwide follow-up study. Acta Psychiatrica Scandinavica. 2018;138(6):492-9. doi: 10.1111/acps.12913.
8. Jin LH. Analysis and treatment of insomnia. Chinese Health Care. 2008;8:381.
9. Bagautdinova J, Mayeli A, Wilson JD, Donati FL, Colacot RM, Meyer N, Fusar-Poli P, Ferrarelli F. Sleep abnormalities in different clinical stages of psychosis: a systematic review and meta-analysis. JAMA psychiatry. 2023;80(3):202-10.https://doi.org/10.1001/jamapsychiatry.2022.4599.
10. Bagautdinova J, Mayeli A, Wilson JD, Donati FL, Colacot RM, Meyer N, Fusar-Poli P, Ferrarelli F. Sleep abnormalities in different clinical stages of psychosis: a systematic review and meta-analysis. JAMA psychiatry. 2023;80(3):202-10.https://doi.org/10.1176/appi.ajp.2020.20070968.

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11. Kapoor G, Chauhan P, Singh G, Malhotra N, Chahal A. Physical activity for health and fitness: past, present and future. Journal of lifestyle medicine. 2022;12(1):9.https://doi. org/10.15280/jlm.2022.12.1.9.
12. Marquez DX, Aguiñaga S, Vásquez PM, Conroy DE, Erickson KI, Hillman C, Stillman CM, Ballard RM, Sheppard BB, Petruzzello SJ, King AC. A systematic review of physical activity and quality of life and well-being. Translational behavioural medicine. 2020;10(5):1098-109. https://doi.org/10.1093/tbm/ibz198.
13. Doyle KL, Toepfer M, Bradfield AF, Noffke A, Ausderau KK, Andreae S, Pickett KA. Systematic review of exercise for caregiver–care recipient dyads: what is best for spousal caregivers—exercising together or not at all?. The Gerontologist. 2021;61(6):e283-301.https://doi.org/10.1093/geront/ gnaa043.
14. An Y, Yang Y, Wang A, Li Y, Zhang Q, Cheung T, Ungvari GS, Qin MZ, An FR, Xiang YT. Prevalence of depression and its impact on quality of life among frontline nurses in emergency departments during the COVID-19 outbreak. Journal of affective disorders. 2020;276:312-5.https://doi.org/10.1016/j.jad.2020.06.047.
15. Morin CM, Belleville G, Bélanger L, Ivers H. The Insomnia Severity Index: psychometric indicators to detect insomnia cases and evaluate treatment response. Sleep. 2011;34(5):601-8.https://doi. Org/10.1093/sleep/34.5.601.
16. Harris ST, Oakley C, Picchioni M. Quantifying violence in mental health research. Aggression and Violent Behavior. 2013;18(6):695-701.https://doi.org/10.1016/j.avb.2013.07.022.
17. He JF, Hong W, Shao Y, Han HQ, Xie B. Application of MOAS for evaluating of violence risk in the inpatients with mental disorders. Fa yi xue za zhi. 2017;33(1):28-31.https://doi.org/ 10.3969/j.issn.1004-5619.2017.01.007.
18. Dolsen MR, Asarnow LD, Harvey AG. Insomnia as a transdiagnostic process in psychiatric disorders. Current psychiatry reports. 2014;16:1-7.https://doi.org/10.1007/s11920-014-0471-y.
19. Patel NK, Newstead AH, Ferrer RL. The effects of yoga on physical functioning and health related quality of life in older adults: a systematic review and meta-analysis. The journal of alternative and complementary medicine. 2012;18(10):902-17.https://doi.org/10.1089/acm.2011.0473.
20. Bridges L, Sharma M. The efficacy of yoga as a form of treatment for depression. Journal of evidence-based complementary & alternative medicine. 2017;22(4):1017-28.https://doi.org/10.1177/2156587217715927.
21. Duraiswamy G, Thirthalli J, Nagendra HR, Gangadhar BN. Yoga therapy as an add-on treatment in the management of patients with schizophrenia–a randomized controlled trial. Acta Psychiatrica Scandinavica. 2007;116(3):226-32.https://doi.org/10.1111/j.1600-0447.2007.01032.x.
22. Vancampfort D, Vanderlinden J, De Hert M, Adamkova M, Skjaerven LH, Catalan-Matamoros D, Lundvik-Gyllensten A, Gomez-Conesa A, Ijntema R, Probst M. A systematic review on physical therapy interventions for patients with binge eating disorder. Disability and rehabilitation. 2013;35(26):2191-6.https://doi.org/10.3109/09638288.2013.771707.
23. Lee S, Kim JH, Chung JH. The association between sleep quality and quality of life: a population-based study. Sleep Medicine. 2021;84:121-6. https://doi.org/10.1016/j. sleep.2021.05.022.
24. Hoseinipalangi Z, Golmohammadi Z, Rafiei S, Kan FP, Hosseinifard H, Rezaei S, Ahmadi S, Ahmadi N, Raoofi S, Aghajani F, Dehnad A. Global health-related quality of life in schizophrenia: systematic review and meta-analysis. BMJ Supportive & Palliative Care. 2022;12(2):123-31.https://doi.org/10.1136/bmjspcare-2021-002936.
25. Zhou R, Ye M, OuYang X, Zhang S, Zheng S, Wang R, Cao P, Yang K, Zhou X. Insomnia and aggression in stable schizophrenic patients: The mediating role of quality of life. Schizophrenia Research. 2024;267:122-9.https://doi.org/10.1016/j.schres.2024.03.024.
26. Huang ZH, Wang F, Chen ZL, Xiao YN, Wang QW, Wang SB, He XY, Migliorini C, Harvey C, Hou CL. Risk factors for violent behaviours in patients with schizophrenia: 2-year follow-up study in primary mental health care in China. Frontiers in psychiatry. 2023;13:947987.https:// doi.org/10.3389/fpsyt.2022.947987.
27. Ercan Doğu S, Kokurcan A, Örsel S. An occupation-based healthy nutrition and wellness program for individuals with schizophrenia. OTJR: Occupational Therapy Journal of Research. 2023;43(4):626-36. https://doi.org/ 10.1177/15394492231153113.

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