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Original Article

Enhancing Geriatric Depression Prognosis in Elderly Patients: The Role of Rehabilitative Nursing Care as an Adjunct to Pharmacotherapy

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SUMMARY

Background: Recent studies suggest music and physical activity may enhance brain plasticity and alleviate depressive symptoms, offering effective non-pharmacological interventions, especially for older adults with mild to moderate depression.
Objective: This study evaluated the prognosis of elderly patients with depression when rehabilitative nursing care was incorporated as an adjunct to pharmacotherapy.
Methods: A total of 80 patients aged ≥ 60 years with major depressive disorder (DSM-5 criteria) were enrolled and divided into a study group (n = 45; nursing care + pharmacotherapy) and a control group (n = 35; pharmacotherapy only). The study group received a structured six-week program including cognitive restructuring, health education, and rehabilitation exercises. Standardized assessments — the Geriatric Depression Scale (GDS), Beck Depression Inventory (BDI), and Beck Anxiety Inventory (BAI) — were administered pre- and post-intervention across a 20-week study period.
Result: The study group showed significantly greater reduction in GDS scores compared to controls (ΔGDS = –3.7 ± 3.9 vs. –0.8 ± 2.45, p = 0.008, Cohen's d = 0.95). BDI and BAI also showed notable improvements (ΔBDI = –8.9 ± 12.9, p = 0.026; ΔBAI = –9.2 ± 14.9, p = 0.033). Cognitive outcomes revealed no significant between-group differences.
Conclusion: Rehabilitative nursing care significantly improved depression outcomes and showed promising effects on anxiety among older adults when combined with pharmacotherapy. These results support its integration into standard geriatric depression management.

1. Introduction

The elderly population faces numerous challenges associated with physical and mental health changes that often accompany aging. Geriatric depression, characterized by a lack of motivation, aggression, social withdrawal, and decreased medication adherence, is a significant but unrecognized mental health challenge for patients and clinicians. The incidence of geriatric depression globally varies between 10 and 20%, with 40% of cases diagnosed with depressive disorder.[1] Clinical presentation of geriatric depression includes mood swings, somatic symptoms, eating disorders, anxiety, aggression, irritability, cognitive and functional impairment, and insomnia, often overlooked as a risk factor for depression in old age.[2] Depression in older adults is associated with poor quality of life, challenges with daily tasks, physical comorbidities, early mortality, and cognitive decline.[3] Early detection and therapy for depression in the elderly are crucial to improve their standard of living, retain optimal levels of functioning and independence, minimize morbidity, death due to suicide, development of medical conditions, and treatment expenses.[4] A well-trained nursing staff, as part of the interdisciplinary care team, can play a significant role in assessing and managing geriatric depression. Screening for geriatric depression is more accurate when predisposing and triggering risk factors are considered, including previous history of depression, physical and chronic disabling illnesses, addictions, and psychosocial risk factors such as gender, personal life factors, lack of communication, social support, and caregiving responsibilities.[5,6]

In light of these challenges, an increasing number of studies have investigated the role of nursing-led interventions in alleviating depressive symptoms among older adults. For instance, Ja'far et al.[21] demonstrated through a meta-analysis that cognitive behavioral therapy (CBT) delivered by trained nurses resulted in improved mood and coping outcomes in elderly patients. Similarly, Frederick et al.[22] reported that nurse-delivered interventions, including individualized emotional support and behavioral activation, were effective in decreasing depression severity in community-dwelling seniors. In addition to psychological techniques, rehabilitative nursing interventions that combine physical activity, motivational interviewing, and personalized care plans have also proven effective. Apóstolo et al.[23] emphasized the importance of psychosocial nursing strategies for depression prevention in older adults, highlighting the potential of non-pharmacological care models. Chan et al.[24] further supported this finding by demonstrating that structured nursing interventions significantly improved emotional well-being and treatment adherence, particularly when integrated into primary care settings.

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Cognitive therapy (CT) has gained awareness in recent years as an effective treatment for depression in older adults. A study of 240 patients with mild to severe depression found that CT treatment had comparable response rates to medication, with lower rates of new depression occurrence compared to selective serotonin reuptake inhibitors (SSRIs) treatment, indicating the long-term effects of CT.[6–8] Music therapy has also shown positive effects in treating dementia-related behavioural and psychological disorders and reducing stress, anxiety, and sadness in geriatric populations.[7–10] Encouraging higher socioeconomic status, participation in rewarding activities, and religious or spiritual commitment can also contribute to resolving depressive symptoms in older adults.[11–13]

2. Materials and methods

2.1. Research design

This study was conducted from January 2022 to February 2023 on elderly patients with diagnosed depression receiving medication. The study has grouped the patients into two groups: the study group (patients receiving nursing care in addition to pharmacotherapy) and the control group (patients receiving only pharmacotherapy). The study conducted a week-long program focused on cognitive recognition, health education, and rehabilitation exercises for aged patients diagnosed with depression. Each week covers various themes and techniques, with six weeks outlined in total. The first week includes an introduction of oneself, cognitive recognition, ABCDE principles, health education, and rehabilitation exercises. Subsequent weeks cover topics such as classifying rational and irrational thinking, understanding emotions, refutation, transforming irrational beliefs into rational beliefs, and evaluating the program. Each session ranges from 20 to 40 minutes, with activities including discussions, exercises, and practising ABCDE principles. Following the 6-week intervention phase, participants continued to be observed without additional interventions for an extended period to assess the durability and sustainability of the intervention effects. Thus, the total study period lasted 20 weeks, including the initial intervention and the subsequent follow-up period.

At the beginning of the trial and after the 20-week research period, both the research group and the control group underwent an identical set of standardized tests administered by a similar team of neuropsychologists. The test battery's average runtime was 45 minutes. After 20 weeks of art therapy, tests were conducted on the study group. The same 20-week period, during which participants did not receive any treatment, was assigned as the control group. Age, level of education, relationship status, and financial standing were all gathered using distributed sociodemographic questionnaires. Additionally, questionnaires were utilized to gather information regarding other disorders besides depression, the frequency of past depressive episodes, and the use of drugs.

The Geriatric Depression Scale (GDS-15) was used to assess depression in older people. This screening tool, which comprises 15 positive/negative inquiries regarding contentment with life, hope, exhaustion, and memories, was intended to identify depressive symptoms in senior people. The threshold for depression is five. Subsyndromal depression was characterized by depression being graded from 1 to 5, moderate depression from 6 to 10, and the severe depression was graded from 11 to 15.

The Beck Depression Inventory (BDI) comprises twenty-one questions about how the person experienced depression in the previous week about symptoms of depression like hopelessness, guilt, irritability, or punishment-related emotions, in addition to physical manifestations like weariness, a drop in libido, and a loss of weight was used to assess depressive symptoms. The BDI score cap was set at 63 because each question was graded on a scale of 0 to 3. Subsyndromal depression was considered to have a score between 1 and 11, whereas depression was deemed to have a score above 12.

The Beck Anxiety Inventory (BAI), which consists of 21 items, asks the subject how they felt in the preceding week regarding common anxiety symptoms, including shaking, sweating, and terror, which were used to assess anxiety. The MMSE, the Path of Making Test A, a Rey Complex Figure (Rey CF), and the Verbal Fluency Test were all part of a comprehensive cognitive evaluation battery that was administered. Normal proficiency was defined as recalling more than 12 or 13 animals in the Animal category of the Verbal Fluency Test. Test A for Trail Making assessed cognitive abilities such as motor speed, executive function, sustained attention, executive functions, and mental flexibility. A visuospatial task called the Rey CF necessitates visual memory and focused attention.

2.2. Detailed nursing intervention

Specific Nursing Measures: Cognitive restructuring therapy sessions (ABCDE method), health education covering depression awareness, self-care, medication adherence, structured rehabilitation exercises, emotional support, and motivational interviewing. Standardized Nursing Protocol: A weekly, structured protocol was followed based on CBT principles and geriatric rehabilitation guidelines, utilizing pre-approved materials, session checklists, and strict session timelines. Nursing Staff Training: All participating nursing staff underwent a two-week intensive training program, which included CBT workshops, role-play, supervised mock sessions, and ongoing weekly supervision to maintain protocol adherence. Implementation Details: Each patient in the intervention group received one structured session per week (20–40 minutes), monitored for attendance and participation. Activities and patient responses were logged in standardized forms.

2.3. Inclusion and exclusion criteria

The following criteria were required for inclusion: a lifelong DSM-5 diagnosis of MDD23, females aged 60 or older, literacy in both reading and writing, and consent to participate throughout the study. Additionally, participants were required to maintain their depressive medication, meaning they could not have changed their pharmaceutical regimen (agent or dose) during the study. Each participant's visiting psychiatrist decided to continue them on their current medication regimen based on the conviction that the present dosage was causing the most improvement in the symptoms they were experiencing while causing the fewest side effects conceivable. If a patient's depression scale scores exceeded the threshold, they were admitted and allowed to participate in all evaluations and treatments. For individuals with cognitive issues suggestive of dementia, a Mini-Mental State Examination (MMSE) score of less than 25, combined with one to four years of formal education, or a score of less than 27 if they have five years or more of formal education, fulfills the exclusion criteria. Drug users, people with degenerative conditions, and those with systemic disorders linked to high mortality and morbidity, like malignancies with poor prognoses or increasing renal impairment, were also excluded from the study.

2.4. Statistic alanalysis

The study used SPSS 25 for practical statistical analysis. The con-

tinuous data have been presented as mean ± standard deviation, while the discrete data have been reported as frequency and its corresponding percentage. The study employed ANOVA as the statistical tool for its analysis. The significance level was set at $p < 0.05$. Before conducting the study, a power analysis was performed using G*Power 3.1 software. Based on an assumed medium effect size (Cohen's d = 0.5), a two-tailed test, an alpha level of 0.05, and a desired power of 0.80, a minimum sample size of 64 participants (32 per group) was calculated. The present study enrolled a total of 80 participants (45 in the study group and 35 in the control group), thus exceeding the minimum requirement. This ensures that the study had sufficient statistical power to detect medium-sized effects. The Geriatric Depression Scale (GDS) as the primary outcome measure, assessing core depressive symptoms among elderly participants. The Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) are designated as secondary outcomes, intended to provide additional insight into depressive severity and comorbid anxiety, which are common among geriatric patients. Given the moderate sample size (n = 80), we opted not to use MANOVA or composite scoring to avoid reducing statistical power and maintain the clarity of interpreting individual symptom domains.

2.5. Ethical statement

This study was approved by the Institutional Review Board (IRB) of Sanquan College of Xinxiang Medical University (Approval No: SCXMU-2022-017). All participants provided written informed consent before enrollment. The study adhered to the Declaration of Helsinki (2013) to ensure ethical compliance in human research. Confidentiality and anonymity of participant data were strictly maintained throughout the study.

3. Results

As shown in Table 1, the study group (n = 45) and the control group (n = 35) were homogeneous at the beginning (time point 1) for all parameters except for age ($p = 0.031$). The effect size (Cohen's d) for ΔGDS was 0.95, indicating a significant clinical effect. The 95% confidence interval (CI) for the mean difference in GDS scores was [-5.2, -2.2]. Education level, the number of preceding depressive episodes, marital status, and depression after age 60 were similar. Pharmacological treatment was divided into three categories: antidepressants alone, antidepressants plus, and antidepressants with anxiolytics and other psychotropic drugs; the groups were also comparable.

The data in Table 2 compare cognitive and psychiatric variables between a control group (n = 35) and a study group (n = 45). The mean scores for MMSE, Trail Making A, Fluency, Rey DR, Rey CF, BAI, BDI, and GDS were provided for both groups. The p-values indicate the statistical significance of the differences between the two groups. Most variables do not show significant differences between the control and study groups, with p-values above 0.05. Beyond statistical significance, the large effect size (d = 0.95) and narrow 95% CI [-5.2, -2.2] for the GDS change confirm the clinical relevance of the intervention's impact on depressive symptoms. However, BAI and BDI show borderline significance ($p = 0.09$ and $p = 0.08$, respectively), suggesting potential differences in anxiety and depression levels between the two groups. Although the p-values for the BDI ($p = 0.08$) and BAI ($p = 0.09$) are slightly above the conventional threshold for statistical significance, these values suggest a trend towards a meaningful difference in depression and anxiety levels between the groups. However, several underlying factors, such as variability in treatment response, social support and environment, functional decline, comorbidities, or even differences in coping mechanisms and psychological resilience, may have contributed to the observed trends. The involvement of such factors requires further investigation with a larger sample size to determine if these differences could achieve statistical significance and provide clearer clinical implications. Further investigation has assessed the significance of these results (Table 2 and Figure 1).

Table 3 shows that variables MMSE 1, Rey DR 1, GDS 1, BDI 1, and BAI 1 have $p < 0.05$, indicating significant differences between T1 and T2 in both control and study groups. Other variables, such as Fluency 1, Trail Making A1, and Rey CF 1, have p-values greater than

Table 2
Cognitive and psychiatric variables in study and control groups.

Cognitive and psychiatric variables	Control group (n = 35)	Study group (n = 45)	p-value
MMSE	28.9 ± 1.9	27.8 ± 2.5	0.17
Trail Making A	36.1 ± 14.2	33.4 ± 12.4	0.59
Fluency	17.8 ± 4.8	17.2 ± 3.7	0.88
Rey DR	47.7 ± 25.8	49.1 ± 27.8	0.88
Rey CF	76.5 ± 20.3	65.8 ± 28.9	0.21
BAI	13.6 ± 16.4	18.9 ± 13.1	0.09
BDI	16.2 ± 9.1	21.3 ± 11.4	0.08
GDS	7.9 ± 4.1	8.9 ± 3.8	0.25

Notes: BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory; Fluency: Verbal Fluency Test; GDS: Geriatric Depression Scale; MMSE: Mini-Mental State Examination; Rey CF: Rey Complex Figure Test; Rey DR: Rey Delayed Recall.

Table 1
Demographic properties of the patients enrolled in this study.

Characteristics	Control group (n = 35)	Study group (n = 45)	p-value
Age (years)	71.8 ± 5.4	67.8 ± 6.1	0.031**
Schooling	13.2 ± 3.9	12.9 ± 3.6	0.42
Marital status, n (%)			
Single	14 (40)	14 (31.1)	
Widowed	9 (25.7)	10 (22.2)	
Married	11 (31.2)	8 (17.8)	
Divorced	1 (2.9)	13 (28.9)	
Initial occurrence following 60 years of age, n (%)	5 (14.2)	8 (17.8)	0.743
The frequency of depressive episodes	3.4 ± 1.7	3.9 ± 2.1	0.228*
Geriatric Depression Scale ≤ 5	9.8 ± 4.2	6.9 ± 5.9	0.164
Medication, n (%)			0.599
Antidepressant and anxiolytic	2 (5.7)	3 (6.7)	
Antidepressant only	20 (57.1)	22 (48.9)	
Antidepressant and psychotropic	13 (37.1)	20 (44.4)	

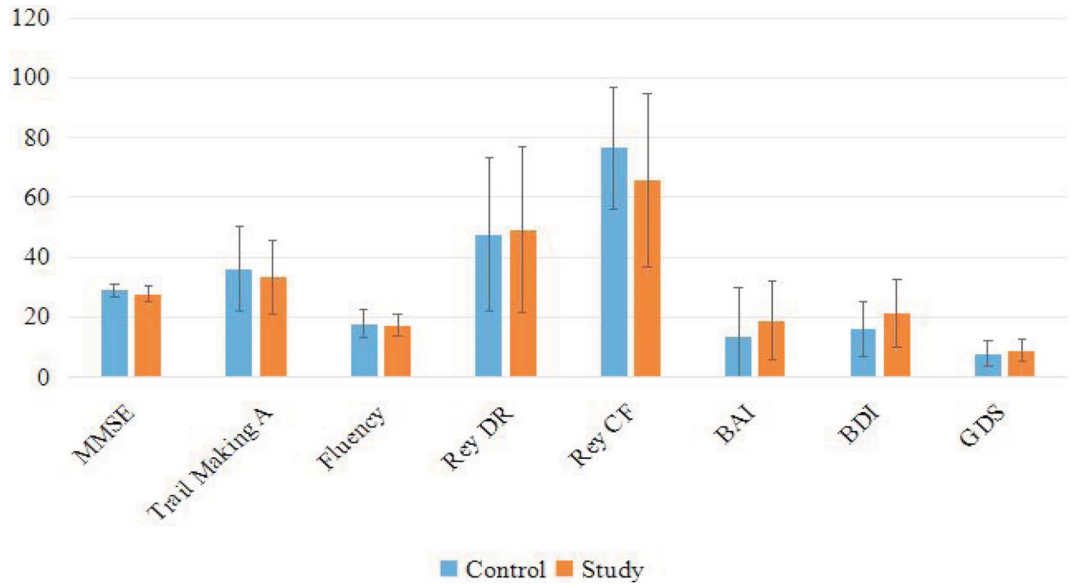

Figure 1. Comparison of cognitive and emotional assessments between the control (blue) and study (orange) groups. Measures include: MMSE: Mini-Mental State Examination (global cognition), Trail Making A: Processing speed and attention, Fluency: Verbal fluency, Rey DR: Delayed recall from the Rey Complex Figure test, Rey CF: Immediate recall of the Rey Complex Figure, BAI: Beck Anxiety Inventory (anxiety levels), BDI: Beck Depression Inventory (depression levels), GDS: Geriatric Depression Scale (depressive symptoms).

Table 3
Comparison of data from Time 1 (T1) and Time 2 (T2) for each group using longitudinal analysis.

T1 and T2	Control group (n = 35)	p1-value	Study group (n = 45)	p2-value
Fluency 1	17.4 ± 4.9	1.01	17.1 ± 3.6	0.951
Fluency 2	17.6 ± 3.8		17.0 ± 4.1	
MMSE 1	28.7 ± 1.8	0.81	27.7 ± 2.4	0.035
MMSE 2	28.8 ± 1.8		28.2 ± 2.6	
Trail Making A1	35.9 ± 13.3	0.28	32.4 ± 11.3	0.151
Trail Making A2	37.3 ± 12.6		35.3 ± 12.0	
Rey DR 1	47.8 ± 26.8	0.2	48.9 ± 27.3	0.003
Rey DR 2	52.5 ± 25.9		60.5 ± 30.4	
Rey CF 1	76.3 ± 21.3	0.3	65.4 ± 29.9	0.571
Rey CF 2	72.3 ± 26.2		68.3 ± 23.9	
GDS 1	7.8 ± 3.76	0.13	6.9 ± 3.5	< 0.001
GDS 2	7.1 ± 3.65		5.9 ± 3.5	
BDI 1	16.2 ± 8.45	0.05	21.3 ± 11.4	< 0.001
BDI 2	14.9 ± 8.87		12.9 ± 10.5	
BAI 1	14.2 ± 15.89	0.33	18.9 ± 13.8	< 0.005
BAI 2	10.9 ± 10.34		9.8 ± 8.6	

Notes: BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory; Fluency: Verbal Fluency Test; GDS: Geriatric Depression Scale; MMSE: Mini-Mental State Examination; Rey CF: Rey Complex Figure Test; Rey DR: Rey Delayed Recall.

0.05, indicating no significant differences between T1 and T2.

Comparison of BDI, BAI, and GDS scores between the study and control groups before and after the intervention. The study group demonstrated more significant reductions in depressive and anxiety symptoms, particularly in GDS scores (p = 0.008).

The study group patients showed a more significant drop in GDS, BDI, & BAI scores. When comparing the modification of cognitive test results between the study and control groups, no discernible difference was observed (Table 4).

4. Discussion

Global aging is occurring quickly. Late-life depression is defined as depression that first manifests in older adults and can take many different forms, such as a relapse of early-onset depression, a new diagnosis of late-onset depression, or a mood disorder brought on by a distinct medical condition, substance use, or prescription regimen.[14] Depression is the most prevalent mental health issue among older people[15] and is linked to a heavy burden of illness that impacts patients, their families, communities, and the economy. According to prevalence surveys, 14% to 20% of seniors in the community have depressive symptoms.[16] These rates are greater for older people who are hospitalized, 12% to 45%, and much higher for people who are in long-term care facilities, an estimated 40%.[17]

Table 4
Improvement in variables among the two group studies and control at the time points T1 and T2.

Delta	Control group (n = 35)	Study group (n = 45)	p-value*
MMSE	0.3 ± 1.0	0.8 ± 1.9	0.091
Trail Making A	2.2 ± 10.5	3.7 ± 12.1	0.361
Fluency	0.3 ± 3.4	0.3 ± 2.9	0.931
Rey DR	5.1 ± 17.9	11.9 ± 20.4	0.381
Rey CF	4.5 ± 16.7	2.8 ± 19.1	0.161
BAI	-3.2 ± 11.8	-9.2 ± 14.9	0.033
BDI	-1.8 ± 4.98	-8.9 ± 12.9	0.026
GDS	-0.8 ± 2.45	-3.7 ± 3.9	0.008

Notes: BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory; Fluency: Verbal Fluency Test; GDS: Geriatric Depression Scale; MMSE: Mini-Mental State Examination; Rey CF: Rey Complex Figure Test; Rey DR: Rey Delayed Recall.

The percentage of older individuals worldwide is projected to nearly double between 2015 and 2050, going from 12% to 22%. In terms of population, this represents a rise from 900 million to 2 billion individuals aged 60 and above. Older individuals have unique physical and mental health issues that must be acknowledged and remedied. Older adults themselves and healthcare professionals frequently neglect mental health issues, and the stigma attached to mental illness discourages people from seeking help. Inadequate training opportunities, a lack of awareness, a virtual absence of chronic disease models, and an unequal allocation of health resources dog the development of geriatric psychiatry in India. Although existing government programmes offer social assistance to the senior

population, but the coverage is insufficient and needs improvement. Enhancing training and research efforts, raising awareness, creating community-based rehabilitation programs, increasing capacity, and establishing an all-encompassing primary healthcare system are urgently needed to tackle senior mental health challenges. To address the unresolved problems of geriatric mental health, it is important to increase intersectoral collaboration, develop enough human resources, and educate the general public and professionals. National geriatric mental health policies, programs, and laws must be implemented immediately to support advocacy and empowerment. Geriatric mental health in India can be greatly improved by taking small measures in all directions.[18]

It is possible to spot patients who require screening using instruments like the GDS by being aware of the predisposing and precipitating circumstances. Continuous follow-up and active drug management are essential to maximize treatment and remission after diagnosis. The medication with the smallest side effect profile and lowest chance of drug-drug interaction should be considered while choosing an antidepressant prescription. Add-on therapies, such as additional medications and psychotherapy, may be tried if remission is not attained. Electroconvulsive therapy is advised in cases of severe, psychotic, or refractory depression in older people.[19] Support should be provided for preventive measures, such as education for individuals with chronic illnesses, behavioral activation, cognitive restructuring, problem-solving skills training, group support, and life reviews.

The empirical data converge to support the conclusion that depression is not a normal aspect of aging. Except in a more limited form, depression is less common in late life than in midlife. Although depression in later life is frequently less severe, the effects can be disastrous. This review offered observations that led to new ideas about the causes of depression, which led to new therapeutic improvements in biological and psychosocial approaches to treating late-life depression. Finally, new models for enhancing the efficacy of late-life depression treatment in the community have been developed due to studies on care access and delivery.[20]

5. Conclusion

The study has concluded a significant improvement in the study group after adding nursing care for geriatric patients with depression. The scales and scores used in this study have shown statistically significant improvement among aged patients with depression after using nursing care as an adjuvant to pharmacotherapy. This remarkable prognosis can be achieved when nursing care is used only as an adjuvant to pharmacotherapy. Further studies should be conducted with other nursing interventions to improve prognosis. The present study has contributed to clinical psychiatric management in the future, and the nursing care should be made as a guideline as an adjuvant to the drug treatment of depression among the geriatric population.

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Author contributions

The authors confirm their contribution to the paper as follows: study conception and design: Jing Wang, Yan Ma; data collection: Yanan Chen; analysis and interpretation of results: Shuangshuang Wang, Yinan Wu, Yan Ma; draft manuscript preparation: Yanan Chen, Shuangshuang Wang. All authors reviewed the results and approved the final version of the manuscript.

Availability of data and materials

The data will be made available upon request to the corresponding author.

Consent for publication

All participants provided consent for the publication of their anonymized data. No personally identifiable information was included in the study.

Conflicts of interest

The authors declare that they have no conflicts.

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