ORIGINAL RESEARCH

Examining High-Risk Factors for Sleep Disorders in Depressed Patients: Evaluating the Impact of Psychological Interventions on Sleep Quality and Mental Well-Being

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ABSTRACT

Objective • This study aims to analyze the risk factors associated with sleep disorders in patients suffering from depression and investigate the efficacy of psychological interventions in improving these conditions.

Methods • A comparative observational study was conducted and a cohort of 162 patients aged 18 to 68, admitted to outpatient or inpatient departments between October 2022 and August 2023, were included in the study. All patients were diagnosed with depression according to the ICD-10 criteria. The patients were divided into two groups: experimental group 1 received cognitive-behavioral therapy (CBT) psychological intervention, while experimental group 2 received conventional psychological treatment. Various parameters, including Hamilton Depression Rating Scale (Ham-D), Hamilton Anxiety Rating Scale (Ham-A), Social Support Rating Scale (SSRS), marital status, and occupation, were assessed and compared between the groups. Multivariate logistic regression was employed to identify risk factors for sleep disorders in depressed patients. The Pittsburgh Sleep Quality Index (PSQI) was utilized to evaluate sleep quality.

Results • Logistic regression analysis revealed that depression severity, anxiety levels, subjective social support, and occupational status were significant risk factors for sleep disorders in depressed patients ($P < .05$). Following intervention, both groups exhibited a significant decrease in PSQI, SAS, and SDS scores, with experimental group 1 demonstrating significantly lower PSQI scores compared to experimental group 2 ($P < .05$). Moreover, experimental group 1 displayed significantly lower SAS and SDS scores compared to experimental group 2 ($P < .05$).

Conclusions • The severity of depression, anxiety levels, subjective social support, and occupational status contribute to the risk of sleep disorders in depressed patients. Implementing psychological interventions for depressed patients with sleep disorders can effectively improve sleep quality, alleviate anxiety, and enhance overall psychological well-being. These interventions represent a valuable approach to manage depression and comorbid sleep disorders. (*Altern Ther Health Med.* [E-pub ahead of print.])

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INTRODUCTION

Sleep disorders are frequently observed in individuals with depression, significantly affecting their overall well-being and quality of life.[1] Depression, a prevalent mental disorder, is marked by persistent feelings of sadness, loss of interest or pleasure, and various cognitive and physical symptoms. Globally, depression affects a significant portion of the population, with an estimated lifetime prevalence of approximately 20%.[2] Sleep disturbances, including insomnia, hypersomnia, and disrupted sleep patterns, are commonly reported by individuals with depression. These sleep disorders not only worsen the symptoms of depression but also lead to impaired cognitive functioning, decreased work productivity, and an elevated risk of comorbidities.[3]

Understanding the correlation between depression and sleep disorders holds paramount importance in clinical practice and research. By exploring the risk factors linked to sleep disturbances in depressed patients, healthcare professionals can determine individuals at heightened risk and deliver tailored interventions.[4] Moreover, exploring the efficacy of psychological interventions in enhancing sleep quality and mental well-being can guide the formulation of comprehensive treatment strategies for this demographic.

However, despite the increasing acknowledgment of the relationship between depression and sleep disorders, significant research gaps persist. Existing studies have predominantly focused on either depression or sleep disorders individually, frequently overlooking the complex relationship between the two.[5] Furthermore, there has been limited exploration into the specific risk factors contributing to sleep disturbances in depressed patients and the efficacy of psychological interventions in this context.[6-8]

Therefore, the objective of this study was to examine the risk factors for sleep disorders in patients with depression and evaluate the beneficial effects of psychological intervention on sleep quality and mental well-being. By addressing this research gap, we attempt to enhance our understanding of the complex relationship between depression and sleep disorders, offering valuable insights for the formulation of targeted interventions aimed at ameliorating sleep outcomes in depressed individuals.

DATA AND METHODS

Study Design

The study adopted a comparative observational design, and a total of 162 patients diagnosed with depression and admitted to our hospital From October 2022 to August 2023 were selected as study participants. The participants were divided into two groups: experimental group 1 (study group) and experimental group 2 (control group). Each group comprised 81 cases, randomly allocated. This design aimed to investigate the impact of psychological intervention on sleep disorders in patients with depression. All patients participating in this study provided informed consent. The treatment and detection methods employed in this study were well-established clinical safety protocols.

Patient Demographics

The study population consisted of 162 patients diagnosed with depression, with a near-equal distribution of males and females. The study encompassed 36 males and 45 females, ranging in age from 22 to 67 years, with an average age of (32.09±7.49) years. The duration of illness spanned from 3 to 7 years. In comparison, the control group consisted of 37 males and 44 females, aged between 23 and 66 years, with an average age of (33.62±7.61) years. No significant disparities were observed between the two groups in terms of general demographic variables such as age and gender ratio ($P > .05$).

Inclusion and Exclusion Criteria

Inclusion criteria were as follows: (1) Patients aged 18 to 68 years; (2) Meeting the diagnostic criteria for depression; (3) Absence of other chronic diseases; (4) Adequate understanding and communication abilities; (5) Absence of sedative-hypnotic drug usage upon admission.

Exclusion criteria were as follows: (1) Hamilton Depression Rating Scale (Ham-D) score <7 points; (2) Presence of other mental illnesses; (3) Sleep disorders following brain injury; (4) Patients with impaired consciousness; (5) Non-cooperative patients.

Implementation of Cognitive Behavioral Therapy (CBT) Psychological Intervention Protocol

Psychological intervention was administered to all patients according to the following protocol:

Informing Patients about the Intervention Plan. Patients were briefed on the purpose and procedure of the psychological intervention. Pertinent information regarding the establishment of psychological interventions and coping strategies for depression and sleep disorders was provided.

Facilitating Emotional Support and Communication. During patient interactions, diligent attention was devoted to monitoring their emotional states. Employing tailored communication strategies, we aimed to guide patients in effectively managing and alleviating negative emotions.

Enhancing Patient Confidence. Depressed individuals frequently exhibit a one-sided cognitive perspective. Concurrently, sleep disorders can exacerbate their lack of confidence in daily life. The intervention sought to empower patients in building confidence, nurturing a positive life outlook, and encouraging proactive participation in treatment.

Comprehensive Support for Patients and Their Families. Recognizing the unique challenges encountered by individuals with depression, including deficits in social skills and a dearth of emotional support, additional attention was paid. The psychological intervention encompassed a proactive exploration of the patient's internal cognition, imparting optimism, and extending support and encouragement to both patients and their families. These efforts significantly influenced the patients' prognosis for the better.

Prioritizing Patient Safety Management. During the implementation of psychological intervention, ensuring patient safety remained paramount. Recognizing the potential for unstable psychological states attributed to sleep disorders, proactive measures were implemented to mitigate the risk of suicidal behavior and support patient safety management.

Promoting Healthy Eating Habits and Muscle Relaxation Techniques. Patients received instruction on adopting healthy eating habits and engaging in muscle relaxation exercises. These interventions were implemented to target sleep disorders by promoting dietary modifications and facilitating muscle relaxation.

Observation Indicators and Evaluation Criteria

Comparison of Ham-D and Ham-A Scores. The comparison of Ham-D and Hamilton Anxiety Scale (Ham-A) scores was conducted. The Ham-D consists of 17 items, with a normal range of 7. Mild depression is indicated by scores ranging from 8 to 17, moderate depression from 18 to 24, and severe depression by scores greater than 24.[9] The Ham-A scale primarily assesses anxiety and comprises 14 items. Each item is scored on a scale of 0 to 4, with scores below 7 considered normal, scores between 7 and 13 indicative of mild anxiety, scores between 14 and 20 suggestive of moderate anxiety, and a score of 21 or higher indicating severe anxiety.[10]

Comparison of Social Support Rating Scale (SSRS) Scores. The comparison of Social Support Rating Scale

(SSRS) scores between the two groups was conducted. This scale encompasses three dimensions: objective support, subjective support, and social support utilization. Higher scores on the SSRS indicate higher levels of social support.[11]

Comparison of Marital and Occupational Status. The study included an analysis of marital and occupational statuses across both groups, aiming to elucidate any potential correlations with the observed outcomes. This comparative examination provides valuable insights into the influence of these demographic factors on the study variables.

Multiple Logistic Regression Analysis. The research utilized a multiple logistic regression equation to investigate the simultaneous impact of multiple predictor variables on the outcomes. This statistical method allowed for a comprehensive examination of the relationships between the independent variables and the dependent variable.

Comparison of Sleep Quality Before and After Psychological Intervention. A comparison was made regarding sleep quality before and after the implementation of psychological intervention using the Pittsburgh Sleep Quality Index (PSQI)® score. This scale comprises seven components: sleep quality, sleep duration, sleep efficiency, sleep disturbances, daytime dysfunction, and use of sleep medication. The total score ranges from 0 to 21 points, with higher scores indicating poorer sleep quality.[12]

Comparison of Psychological Status Before and After Psychological Intervention. The study conducted a comparison of the Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) scores before and after the psychological intervention to evaluate the psychological status of the study group patients.

Statistical Analysis

Statistical analysis was conducted utilizing SPSS 24.0 software® (IBM, Armonk, New York, USA). Measurement data are reported as mean ± standard deviation ($\bar{x} \pm s$), with t tests performed for between-group comparisons. The chi-square test (χ^2) was utilized for categorical data, presented as percentages, with statistical significance set at $P < .05$. Logistic multiple regression analysis was employed to examine the multifactorial risk factors for sleep disorders in patients with depression, with significance determined at $P < .05$.

RESULTS

Comparison of Ham-D and Ham-A Scores between Groups

Upon comparing the Ham-D and Ham-A scores between the two groups, it was noted that the research group exhibited significantly higher scores for depression and anxiety criteria compared to the control group. This result suggests a greater severity of depressive symptoms and depressive sleep disorders among patients in the research group ($P < .05$). The statistical significance of this difference is represented in Table 1.

Comparison of SSRS Scores Between Groups

The comparison of SSRS scores between the two groups showed no statistically significant differences in objective support and social support utilization across both dimensions ($P > .05$). However, in terms of subjective social support, the scores in the experimental group were significantly higher than those in the control group ($P < .05$), indicating a notable disparity, refer to Table 2.

Comparison of Marital Status and Occupation Between Groups

The comparison of marital status between the two groups revealed no significant differences ($P > .05$). However, occupational status exerted a significant influence on sleep disorders ($P < .05$). Further details of these differences are provided in Tables 3 and 4, as well as Figures 1 and 2.

Table 1. Comparison of Ham-D and Ham-A Scores in the Two Groups ($\bar{x} \pm s$)

Group	Ham-D	Ham-A
Experimental Group 1 (n=81)	18.57±2.25	16.65±1.82
Experimental Group 2 (n=81)	14.16±1.35	12.28±1.65
t	4.072	2.331
P value	.004	.024

Notes: Data are presented as mean ± standard deviation. An independent samples t test was conducted to compare scores between the two groups. Significant differences were observed in Ham-D scores ($t = 4.072$, $P = .004$) and Ham-A scores ($t = 2.331$, $P = .024$) between experimental group 1 and experimental group 2.

Table 2. Comparison of SSRS Scores of Patients in Both Groups ($\bar{x} \pm s$)

Group	Objective Support	Subjective Social Support	Social Support Utilization
Experimental group 1 (n=81)	8.55±0.53	17.23±2.13	6.44±0.81
Experimental group 2 (n=81)	8.35±0.78	22.87±2.41	6.55±0.77
t	0.082	2.301	0.115
P value	.504	.004	.654

Note: Data are presented as mean ± standard deviation. An independent samples t test was conducted to compare scores between the two groups. A significant difference was observed in subjective social support scores ($t = 2.301$, $P = .004$) between experimental group 1 and experimental group 2. No significant differences were found in objective support ($t = .082$, $P = .504$) and social support utilization ($t = .115$, $P = .654$) between the two groups.

Table 3. Marital Status of Patients in Both Groups

	Marital Status			
Group	Unmarried (%)	Married (%)	Dissociation (%)	Loss of Spouse (%)
Experimental Group 1 (n=81)	18 (0.22)	38 (0.47)	15 (0.19)	10 (0.12)
Experimental Group 2 (n=81)	8 (0.15)	22 (0.42)	15 (0.28)	8 (0.15)
χ^2	2.547	2.441	0.568	3.417
P value	.557	.554	.741	.954

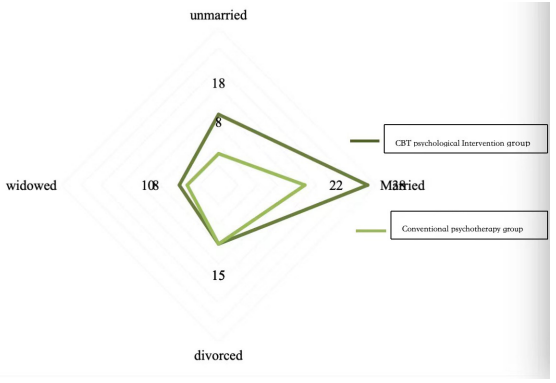
Note: The chi-square (χ^2) values indicate the degree of association between marital status categories in the two groups. P values assess the significance of differences in marital status distribution between the groups.

Table 4. Occupational Status of the Patients in Both Groups

Group	Employed	Unemployed
Experimental Group 1 (n=81)	63 (0.78)	18 (0.22)
Experimental Group 2 (n=81)	25 (0.47)	28 (0.52)
χ^2	7.072	2.331
P value	.004	.014

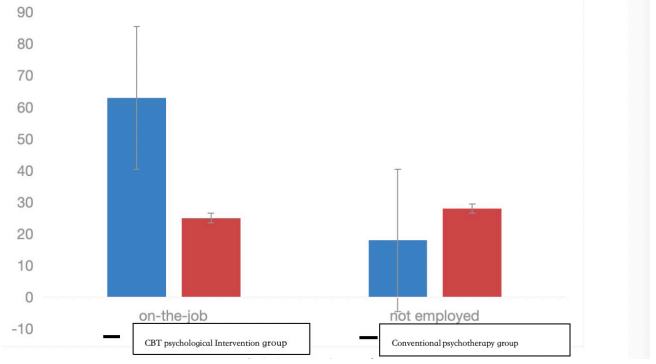
Note: The chi-square (χ^2) values indicate the degree of association between employment status categories in the two groups. P values assess the significance of differences in employment status distribution between the groups.

Figure 1. Comparison of Marital Status Between the Two Groups



Note: The marital status distribution is represented as percentages for each category in both experimental group 1 and experimental group 2.

Figure 2. Occupational Status Comparison Between the Two Groups



Note: The bar diagram illustrates the distribution of occupational status in both Experimental group 1 and experimental group 2.

Table 5. Logistic Regression Analysis Results for Sleep Disorders in Depressive Patients

Assessment	β value	Wald value	S.E. value	*P* value	*OR* value
Ham-D	-0.197	10.263	0.149	0.006	4.005 (1.311~4.716)
Ham-A	-0.203	.5904	0.627	0.021	2.963 (1.108~3.340)
Subjective Support	-0.141	8.913	0.551	0.011	2.041 (1.337~38).20
Occupational Status	1.246	9.247	1.549	0.015	0.470 (0.379~1.006)

Note: Occupational status distribution among patients in experimental group 1 and experimental group 2 is presented. The chi-square (χ^2) values indicate the degree of association between employment status categories in the two groups. *P* values assess the significance of differences in employment status distribution between the groups. β value: Beta coefficient; Wald value: Wald statistic; S.E. value: Standard Error; *P* value: Significance level, and OR value: Odds Ratio. The confidence intervals for Odds Ratios are presented within parentheses.

Table 6. Comparison of PSQI Scores Before and After Intervention in Experimental Group 1 and Experimental Group 2

Groups	Before Intervention	After Intervention
Experimental Group 1 (n=81)	8.77±1.25	3.58±0.51[a]
Experimental Group 2 (n=81)	8.79±1.29	5.49±1.23[a]
t	-0.100	-12.910
P value	.920	<.001

[a]statistically significant difference compared to before the intervention ($P < .05$)

Table 7. Comparison of SAS and SDS Scores Before and After Intervention between Both Groups

	SAS		SDS	
Group	Before Intervention	After Intervention	Before Intervention	After Intervention
Experimental Group 1 (n=81)	60.75±5.51	35.75±3.33[a]	58.23±4.53	36.55±3.53[a]
Experimental Group 2 (n=81)	60.81±5.91	45.88±3.61[a]	59.02±4.79	45.66±5.26[a]
t	-0.067	-18.563	-1.078	-12.943
P value	.947	<.001	.282	<.001

[a]Statistically significant difference compared to before the intervention ($P < .05$)

Abbreviations: SAS, Self-Rating Anxiety Scale; SDS,: Self-Rating Depression Scale.

Multivariable Logistic Regression Analysis of Risk Factors for Sleep Disorders in Depressive Patients

A multivariable logistic regression analysis was performed to explain the risk factors associated with sleep disorders in depressive patients. The findings indicated that the severity of depression, the presence of anxiety, subjective social support, and occupational status were all notable risk factors for sleep disorders in individuals with depression. These results are further detailed in Table 5.

Comparison of PSQI Scores Before and After Intervention

Before the intervention, there were no significant differences in PSQI scores between experimental group 1 and experimental group 2 ($P > .05$). However, following the intervention, both groups exhibited a noteworthy reduction in PSQI scores. Notably, experimental group 1 demonstrated significantly lower scores compared to experimental group 2 ($P < .05$), indicating a substantial improvement in sleep quality among depressive patients with sleep disorders following Cognitive Behavioral Therapy (CBT) group psychological intervention. These findings are detailed in Table 6.

Comparison of SAS and SDS Scores Before and After Intervention

The comparison of depression and anxiety scores before and after intervention revealed no significant differences in SAS and SDS scores between experimental group 1 and experimental group 2 ($P > .05$) before the intervention. However, following the intervention, both groups exhibited a notable reduction in SAS and SDS scores. Notably, experimental group 1 displayed significantly lower scores compared to experimental group 2 ($P < .05$), indicating a substantial improvement in adverse psychological emotions among depressive patients with sleep disorders following CBT group psychological intervention. These results are presented in Table 7.

DISCUSSION

Depression stands as one of the most prevalent mental disorders, characterized primarily by emotional instability and sleep disturbances.[13] Group psychotherapy represents an integrative approach that merges psychological theories with medical interventions. Its core objective revolves around enhancing patient awareness of adverse emotions and

behaviors, fostering patient initiative, and promoting better collaboration between treatment providers and patients.[14] Ultimately, the aim is to improve the sleep quality of individuals struggling with depression.

Current clinical research indicates that integrating psychological interventions for depressive patients with sleep disorders enables prompt assessment of changes in the patient's psychological state. Timely communication aimed at addressing emotional concerns has been shown to effectively ameliorate sleep quality and alleviate depressive symptoms. Furthermore, this intervention not only enhances psychological well-being but also mitigates anxiety, thereby indirectly improving depressive symptoms and enhancing overall sleep quality.[15,16]

Past studies[17] suggest that psychological and emotional states play a significant role in the development of sleep disorders among depressive patients. The emergence of adverse emotions often leads to heightened anxiety levels, consequently affecting sleep quality and contributing to the onset of sleep disorders. The findings of our study validate these observations. Through a comparison of Ham-D scores and Ham-A scores between the two groups, it was evident that patients in the study group exhibited higher levels of depression and anxiety compared to those in the control group. Heightened anxiety among patients intensifies depressive symptoms, thereby extending a detrimental cycle that adversely affects sleep quality.

Our findings revealed that depressive patients experiencing a dearth of subjective social support demonstrated diminished confidence and resilience in coping with psychological stressors. Consequently, these patients tended to develop a one-sided perception of themselves, leading to exacerbated depressive symptoms and the onset of sleep disorders.[18] This study confirms these findings through a comparative examination of SSRS scores between the two groups. The absence of subjective social support further increases anxiety levels, Eventually leading to the development of sleep disorders.

The underlying pathological mechanisms behind sleep disorders in individuals with depression remain incompletely explained and have been the subject of epidemiological research.[19] Interestingly, occupational status emerges as a factor influencing the severity of sleep disturbances among depressive patients. This investigation suggests that employment status exerts a notable influence on the sleep quality of individuals fighting depression. This phenomenon may be attributed to heightened work-related stressors and inadequate psychological coping mechanisms among employed individuals, thereby promoting adverse psychological states and subsequent sleep disorders.

Unemployment presents its own set of challenges, potentially leading to a lack of social understanding, difficulty adapting to life's variations, and inadequate communication skills. These factors may collectively contribute to the emergence of depressive symptoms and subsequent sleep disturbances. In contrast, the relationship between psychological states and sleep disorders in individuals with depression underscores the significance of targeted interventions. Specifically, CBT emerges as a promising avenue for alleviating negative emotions, fostering an optimistic outlook towards life's pressures, boosting self-confidence, mitigating anxiety, and ultimately enhancing sleep quality.[20]

After the intervention, notable reductions were observed in the PSQI, as well as in the scores for the SAS and SDS in both experimental groups. Significantly, experimental Group 1 exhibited notably lower scores across the PSQI, SAS, and SDS scales when compared to experimental Group 2. These findings suggest a marked enhancement in sleep quality and amelioration of adverse psychological symptoms among patients with depression and concomitant sleep disorders following CBT group psychological intervention.

This study indicates that CBT psychological intervention adopts a problem-centered and action-oriented treatment approach. It proves effective in addressing specific issues related to diagnosed mental disorders, aiding patients in identifying and implementing effective strategies to attain targeted goals, and alleviating symptoms of the condition. These findings emphasize the significance of integrating psychological interventions into the treatment of depression and sleep disorders. Specifically, they highlight the role of several factors identified as risk factors for sleep disorders in depressive patients, including the severity of depression, the presence of anxiety, subjective social support, and occupational status.

Depression commonly coincides with psychological distress and negative emotions, which can exacerbate sleep difficulties. Anxiety often accompanies depression and can worsen sleep disruptions. Furthermore, inadequate subjective social support and unfavorable occupational circumstances may intensify sleep challenges among individuals with depression. Moreover, the study revealed that psychological interventions, particularly CBT, significantly enhanced both sleep quality and psychological well-being in depressed patients.

Psychological interventions target maladaptive thoughts, behaviors, and emotions linked to depression and sleep disorders. These interventions offer coping strategies, foster positive perspectives on life, and increase social support, thereby assisting individuals with depression in cultivating healthier sleep habits and reducing anxiety symptoms. Additionally, relaxation techniques and guidance on adopting healthy habits provided during these interventions may further enhance sleep quality.

Study Limitations

While this study provides valuable insights, it is crucial to recognize certain limitations that could affect the generalizability and interpretation of the findings. Firstly, the study sample was restricted to patients from a specific geographic region in China. This limitation may restrict the applicability of the results to other populations with diverse cultural backgrounds and healthcare systems. Cultural

factors, including attitudes towards mental health and treatment-seeking behaviors, may influence the presentation and treatment of sleep disorders in individuals with depression.

Secondly, the study design utilized a non-randomized approach to assign participants to the experimental and control groups. This introduces the possibility of selection bias and confounding variables that could influence the observed outcomes. Conducting a randomized controlled trial with larger sample sizes and robust randomization methods would offer more compelling evidence regarding the efficacy of psychological interventions in improving sleep quality and mental states among patients with depression.

Additionally, the study primarily utilized self-reported measures, such as questionnaires, to evaluate sleep quality, depression severity, anxiety levels, and other variables. Self-report measures are subjective and susceptible to individual interpretation and recall biases. Incorporating objective measures, such as polysomnography or actigraphy, would offer more precise and unbiased assessments of sleep parameters.

Furthermore, the duration and intensity of the psychological intervention were not standardized across participants. Variations in the delivery and dosage of the intervention may have influenced the outcomes. Future studies should consider implementing a standardized intervention protocol to ensure consistency and comparability. Lastly, the follow-up period in this study was relatively short, limiting the assessment of the long-term effects of psychological interventions on sleep quality and mental states in depression patients. Long-term follow-up studies are needed to evaluate the durability and sustainability of the intervention effects over an extended period.

CONCLUSION

In conclusion, this study highlighted the risk factors associated with sleep disorders in depression patients while highlighting the efficacy of psychological interventions in enhancing sleep quality and psychological well-being. In future, it is important to validate and build upon these findings, explore long-term effects, search underlying mechanisms, and account for cultural influences to advance the management of sleep disturbances among individuals grappling with depression. Such efforts hold promise for refining treatment approaches and ultimately improving the overall quality of life for those affected by this complex relationship of mental health challenges.

CONFLICTS OF INTEREST

The authors report no conflict of interest.

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AUTHOR CONTRIBUTIONS

Xiaomei Jiang and Caiqin Xi have equal contributions to this work.

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AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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