

Survey and Analysis of Mental Health among Otolaryngology Nurses Following the Conclusion of COVID-19 Prevention and Control Measures

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Abstract

Aims/Background The coronavirus disease 2019 (COVID-19) pandemic placed unique pressures on healthcare workers, especially nurses. This study examines the factors influencing mental health, stress perception, and burnout among otolaryngology nurses after the cessation of COVID-19 prevention and control.

Methods A cross-sectional study was conducted among 220 otolaryngology nurses in Sichuan province from 20 January to 28 January, 2023. Data were collected using a general information questionnaire, the Nurse Workplace Mental Health Questionnaire, the Chinese Perceived Stress Scale (CPSS-14), and the Maslach Burnout Inventory-General Survey (MBI-GS). Statistical analyses included the Kruskal-Wallis test, Spearman correlation analysis, and multiple linear regression to identify significant factors and relationships within the dataset.

Results Of the 220 questionnaires distributed, 218 were valid, yielding a recovery rate of 99.09%. The cohort included 3 males (mean age: 34.67 ± 12.39) and 215 females (mean age: 35.63 ± 9.27). The average mental health score was 128.10 ± 21.29 , indicating a moderate level of psychological well-being. The CPSS-14 average score was 37.42 ± 7.27 , reflecting moderate stress, while MBI-GS scores highlighted varying levels of burnout, especially in emotional exhaustion (median = 10.00). The Kruskal-Wallis test identified significant factors affecting mental health, stress, and burnout, including family support, COVID-19 testing status, staffing adequacy, frequency of caring for critically ill patients, teamwork satisfaction, job satisfaction, and resignation plans ($p < 0.05$). Spearman correlation analysis revealed significant negative associations between mental health and stress ($r = -0.525$) and total burnout scores ($r = -0.646$; $p < 0.01$). Multiple linear regression identified emotional exhaustion ($\beta = -0.922$), low personal accomplishment ($\beta = -0.623$), and inadequate staffing ($\beta = -2.769$) as significant negative predictors of mental health, while teamwork satisfaction ($\beta = 5.516$) and job satisfaction ($\beta = 5.032$) were positively associated with improved mental health ($p < 0.01$).

Conclusion Otolaryngology nurses experience notable mental health challenges in the post-pandemic era, driven by stress and burnout. Addressing staffing shortages, fostering teamwork, and enhancing job satisfaction are critical strategies to improve their psychological well-being.

Key words: COVID-19; mental health; stress; psychological; burnout; professional; nurses

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Introduction

In December 2019, a cluster of patients presenting with respiratory symptoms, including low-grade fever, headache, fatigue, dry cough, and sore throat, was reported in Wuhan, Hubei province, China. In severe cases, the illness progressed

to acute respiratory distress syndrome, multiple organ dysfunction syndrome, and septic shock (Hui et al, 2020). Following extensive research, the disease was officially named coronavirus disease 2019 (COVID-19), and the causative pathogen was identified as a novel coronavirus. COVID-19 is thought to spread primarily through droplet transmission, contact transmission, and aerosol transmission (Liu et al, 2021). The COVID-19 pandemic rapidly evolved into a global public health crisis, marked by its sudden onset, high transmissibility, lack of specific treatment, and potential fatality (Tang et al, 2021).

The emergence of variants such as the Delta and Omicron further exacerbated the pandemic, causing resurgences in many countries and regions (Bian et al, 2022). Widespread negative psychological effects, including depression, anxiety, hypochondriasis, and emotional collapse among the general public accompanied the escalating number of confirmed and suspected cases.

Traumatic events, such as a global pandemic, can have profound and lasting impacts on mental health. Studies suggest that 64%–95% of individuals experience at least one traumatic event in their lifetime, with psychological injuries often having broader and more enduring impacts compared to physical injuries (Kessler et al, 2005). The COVID-19 pandemic, due to its strong transmissibility, prolonged duration, and severe implications, has significantly impacted physical and mental health. For instance, Labrague et al (2021) surveyed 303 college students and observed that the pandemic exacerbated social loneliness and exposed a lack of effective coping strategies. Similarly, Wang et al (2020) reported a 50.92% prevalence of depressive symptoms among the general public during the pandemic, a notable increase compared to the non-epidemic periods. Moreover, Pu et al (2021) emphasized the critical role of medical staff and civil servants in pandemic prevention and control, highlighting them as key groups requiring focused attention during the pandemic. The mental health status of these special groups warrants greater societal concern. Understanding the public's mental health in the context of the pandemic, identifying the factors affecting physical and mental well-being, and alleviating the associated psychological burden in the later stages of the pandemic are pressing social challenges. These issues are pertinent in normalized epidemic prevention and control measures, necessitating targeted interventions and sustained efforts to support mental health.

Nurses are at the forefront of pandemic prevention, control, and treatment efforts, serving as the backbone of the healthcare response team while shouldering heavy responsibilities and risks (Schwartz et al, 2020). During the early stages of the COVID-19 pandemic, incomplete statistics indicated that approximately 28,600 nurses were part of the medical teams supporting Hubei province, comprising nearly 70% of the total healthcare workforce deployed (Health News, 2020). The unique challenges of the nursing profession make nurses particularly vulnerable to psychological issues during public health crises. Factors such as a demanding work environment, high treatment pressures, elevated infection risk, and occasional lack of understanding from patients contribute to significant psychological distress among nurses (Jia et al, 2021). Surveys during the pandemic have revealed that the prevalence of anxiety symptoms among healthcare workers reached 36.3%, significantly

higher than in the general population, with nurses experiencing the highest rates (Luo et al, 2020). Traumatic stress effects are particularly concerning, as they become chronic if symptoms persist beyond three months after the stressor (Morice et al, 2022). Early detection and timely intervention for post-traumatic symptoms are, therefore, essential to prevent long-term psychological distress.

In recent years, the mental health challenges faced by clinical nurses have garnered increasing attention. Studies have shown that sustained work-related stress can lead nurses to experience anxiety, depression, irritability, emotional instability, and reduced passion for their profession (Jungmar Ridell and Orvelius, 2023). These symptoms, collectively referred to as chronic fatigue syndrome (CFS), often culminate in feelings of boredom, helplessness, hopelessness, and eventual burnout. If left unaddressed, CFS can severely impair the ability of nurses to function effectively and may contribute to doctor-patient conflicts (Aylett and Fawcett, 2003). In China, CFS is prevalent among clinical nurses. Li et al (2020) reported that the psychological status of nurses differs across departments, with those in internal medicine and surgical units exhibiting worse mental health compared to outpatient nurses. Nurses aged 20–29 had the highest Chinese Perceived Stress Scale (CPSS) scores, indicating significant psychological stress, likely due to limited professional experience and weaker stress tolerance. In contrast, nurses aged 30–39 demonstrated stronger coping abilities, better adaptability to work pressures, and lower psychological distress levels due to their accumulated practical experience and clinical expertise. These findings highlight the critical need to address the mental health disparities among nurses, especially those in high-stress departments or early in their careers.

Despite existing research on the mental health of healthcare workers during the COVID-19 pandemic, there remains a notable gap in studies specifically examining otolaryngology nurses. This is particularly significant given their frequent interactions with tracheostomy patients, which increases their exposure to aerosol transmission and associated risks during the pandemic. The unique challenges faced by otolaryngology nurses underscore the need for targeted research to understand the psychological impact of prolonged high-stress exposure and to identify key factors influencing their mental health.

During the pandemic, the high-intensity workload left many nurses with chronic fatigue, which has persisted into the post-pandemic period. This prolonged exhaustion contributes to emotional instability and exacerbates occupational burnout. Moreover, the specialized care demands of tracheostomy patients place additional strain on their physical and psychological resilience. Compounding these challenges is the increasing volume of patients seeking medical care post-pandemic, further intensifying their workload and stress levels.

The psychological well-being of medical staff affects their performance and has broader implications for patients, families, and society (Zhou et al, 2016). A study has shown that excessive psychological pressure on healthcare workers can destabilize doctor-patient relationships and contribute to disputes (Witkoski and Dickson, 2010). Understanding the mental health challenges specific to otolaryn-

gology nurses is crucial for developing targeted interventions to support this essential group of healthcare professionals.

To address this gap, the present study employed an online survey method to collect data from 220 otolaryngology nurses for a retrospective analysis. The study investigated the mental health status of otolaryngology nurses following the relaxation of COVID-19 prevention measures and explored the factors influencing their psychological well-being. By analyzing the psychological impacts of prolonged high-stress exposure and identifying key contributors to mental health outcomes post-pandemic, this research aimed to provide actionable insights for designing targeted interventions to alleviate psychological distress and improve resilience among otolaryngology nurses.

Methods

Research Object

This study employed a retrospective survey involving 220 otolaryngology nurses working in Sichuan province conducted between 20 January and 28 January, 2023, following the lifting of COVID-19 restrictions. Ethical clearance for this study was granted by the Ethics Committee of West China Hospital, Sichuan University, with an exemption based on compliance with the relevant policy regulations, including the National Guidelines for Ethical Conduct in Research Involving Human Subjects.

This study met the criteria for exemption as it utilized anonymized data from existing records, where participants could not be identified directly or indirectly through linked identifiers. All procedures adhered to the ethical principles outlined in the Declaration of Helsinki. Additionally, informed consent was obtained from all participating nurses.

Inclusion and Exclusion Criteria

Inclusion Criteria

- (1) Participants must have passed the National Nurse Practitioner Qualification Examination and completed the necessary professional registration.
- (2) Participants must be aged 18 years or older.
- (3) Participants must have provided informed and voluntary consent to participate.
- (4) Participants must not have any history of mental or consciousness disorders.

Exclusion Criteria

- (1) Nurses who were not on duty during the study period, including those on maternity, sick, or vacation leave.
- (2) Nurses unable to continue working during the investigation period or those transferred from the front-line midway through the study.
- (3) Nurses currently undergoing training or internship within the hospital.
- (4) Nurses with a documented history of mental illness or psychological disorders.

(5) Nurses with clinically confirmed physical conditions affecting critical organs such as the heart, lungs, liver, or kidneys.

Data Collection

We administered a general information questionnaire, the Nurse's Workplace Mental Health Questionnaire (NWMHQ), the Chinese Perceived Stress Scale (CPSS), and the Maslach Burnout Inventory-General Survey (MBI-GS) to 220 otolaryngology nurses. All participants provided informed consent, and professionally trained investigators guided them through completing the questionnaires. Participants were instructed to answer all items honestly and to submit their responses independently. Investigators strictly adhered to confidentiality protocols to safeguard the personal information of the participants. Following data collection, incomplete or logically inconsistent responses were excluded. The remaining data underwent detailed analysis to identify potential psychological intervention points.

Observation Indicators

General information questionnaire: A custom-designed questionnaire was developed for otolaryngology nurses based on a comprehensive literature review and expert consultation. It collected demographic and professional data, including sex, education level, years of service, professional title, monthly income, night shift frequency, hospital level, marital status, fertility status, family support for their work, results of nucleic acid or antigen tests, department staffing conditions, teamwork satisfaction, job satisfaction, and resignation intentions.

NWMHQ: This questionnaire assesses six dimensions of mental health-emotional state, psychological safety, positive relationships, resilience, self-efficacy, and subjective well-being across 32 items. Validated in the Chinese nursing population, the questionnaire demonstrates excellent reliability (Cronbach's $\alpha = 0.948$) and construct validity (Lai et al, 2022). Scores range from 32 to 160, with higher scores indicating better mental health.

CPSS: This scale assesses perceived stress over the past month in three contexts: changes in stressors, major events, and daily responsibilities. The 14-item scale evaluates two dimensions of stress: tension, and loss of control, using a 5-point Likert scale. Total scores range from 14 to 70, and stress levels are categorized as low (14–28), moderate (29–42), high (43–56), and very high (57–70). Adapted from the original Perceived Stress Scale (PSS) by Yang and Huang (2003), the CPSS has been culturally tailored for use in China. It has demonstrated high reliability (Cronbach's $\alpha = 0.846$) and validity in Chinese populations, making it appropriate for this study (Zhou et al, 2023).

MBI-GS: This is a 15-item scale that measures occupational burnout across three dimensions: emotional exhaustion, cynicism, and low achievement. Participants rate the frequency of their experiences using a 7-point Likert scale, ranging from 0 ("every day") to 6 ("never"). Emotional exhaustion and cynicism are scored positively, while low achievement is reverse-scored. Total scores are calculated by summing the items, averaging them, and converting the results to a standardized 100-point scale by multiplying by 20. The scale categorizes burnout levels as fol-

lows: (a) Below 50 points: good working status; (b) 50–75 points: mild burnout; (c) 75–100 points: severe burnout; (d) Above 100 points: very severe burnout.

The MBI-GS has been extensively validated across various professional settings, including nursing, and demonstrates strong psychometric properties in Chinese populations (Cronbach's $\alpha = 0.875$) (Han et al, 2015).

Statistical Method

Data was performed using SPSS version 26.0 software (IBM Corp., Armonk, NY, USA), incorporating categorical and continuous data. Categorical data were expressed as frequencies and percentages [n (%)], with comparisons conducted using the Chi-square test (χ^2). Continuous data were analyzed based on their distribution.

The normality of continuous data was assessed using the Shapiro-Wilk test. For data with $p > 0.05$, indicating normal distribution, results were presented as mean \pm standard deviation (SD) and analyzed using the t -test. For data with $p < 0.05$, indicating non-normal distribution, results were expressed as median (Q1, Q3), and comparisons were performed using the Kruskal-Wallis one-way analysis of variance (ANOVA). Dunn's post-hoc tests were applied to identify specific group differences when significant differences were detected. To evaluate relationships between variables, Spearman correlation analysis was conducted. Statistical significance was defined as $p < 0.05$ (*) for significant results and $p < 0.01$ (**) for highly significant results.

Multiple linear regression was employed to examine the correlation between the dependent variable and multiple independent variables. Prior to conducting the regression analysis, key assumptions were systematically evaluated to ensure the validity of the model. Multicollinearity was assessed using the Variance Inflation Factor (VIF), where values exceeding 10 indicated significant multicollinearity among the independent variables. The normality of the residuals was tested using the Shapiro-Wilk test, with a p -value > 0.05 suggesting that the residuals were normally distributed. To verify homoscedasticity, a scatter plot of residuals against the predicted values was examined to confirm that the variance of the residuals remained constant across all levels of predicted values.

Results

General Characteristics of Otolaryngology Nurses

A total of 218 valid questionnaires were retrieved, with an effective recovery rate of 99.09%. The sample included 3 male nurses with an average age of 34.67 ± 12.39 and 215 female nurses with an average age of 35.63 ± 9.27 years. Additional demographic and professional characteristics are presented in Table 1.

Mental Health Scale Scores of Otolaryngology Nurses

The mental health survey revealed an overall average score of 128.10 ± 21.29 for the 218 otolaryngology nurses, indicating moderate psychological well-being. Analysis of individual dimensions provided further insights into the specific aspects of their mental health. The emotional state dimension scored 23.88 ± 5.38 , suggest-

Table 1. General characteristics of otolaryngology nurses (n = 218).

Factor	Category	Number of people (n)	Composition ratio (%)
Sex	Male	3	1.4
	Female	215	98.6
Education level	Technical secondary school	1	0.5
	College	30	13.8
	Undergraduate	182	83.5
	Graduate and above	5	2.3
Length of service (years)	<3	50	22.9
	3–10	105	48.2
	>10	63	28.9
Professional title	Nurse	29	13.3
	Nurse practitioner	97	44.5
	Supervisor nurse and above	92	42.2
Monthly income (CNY)	<5000	35	16.1
	5000–10,000	147	67.4
	>10,000	36	16.5
Night shift frequency	<5 time/m	114	52.3
	≥5 time/m	104	47.7
Hospital-level	Top three comprehensive	178	81.7
	Triple B comprehensive	28	12.8
	Second class comprehensive	11	5.0
	ENT specialist hospital	1	0.5
Marital status	Single	57	26.1
	Married	156	71.6
Fertility status	Divorced	5	2.3
	Nulliparous	77	35.3
	Has one child	100	45.9
Family's understanding of work	Has two or more children	41	18.8
	Understanding	178	81.7
	General	39	17.9
COVID-19 testing status	Positive	145	66.5
	Negative	23	10.6
	Not tested	50	22.9
Department staffing	Adequate	16	92.7
	Insufficient	202	7.3
Teamwork satisfaction	Satisfied	180	82.6
	General	36	16.5
	Not satisfied	2	0.9
Job satisfaction	Satisfied	164	75.2
	General	47	21.6
	Not satisfied	7	3.2
Intention to leave	Leave within 1 Year	7	3.2
	Leaving after 1 Year	9	4.1
	No intention to leave	202	92.7

Note: 1 USD = 7.09 CNY. COVID-19, coronavirus disease 2019.

ing variability in the ability of the nurses to manage emotional challenges, while the psychological safety dimension scored 19.45 ± 3.73 , highlighting a need for a more supportive work environment. The positive relationships dimensioned scored

Table 2. Mental health scale scores of otolaryngology nurses.

Dimension	Score (Mean \pm SD)
Emotional state	23.88 \pm 5.38
Psychological safety	19.45 \pm 3.73
Positive relationship	16.72 \pm 3.06
Mental flexibility	24.18 \pm 4.70
Self-efficacy	24.68 \pm 4.34
Subjective well-being	19.19 \pm 3.96
Total score	128.10 \pm 21.29

Table 3. Chinese Perceived Stress Scale (CPSS-14) scores of otolaryngology nurses.

Dimension	Score (Mean \pm SD)
Tension	18.61 \pm 4.98
Feeling out of control	18.80 \pm 6.01
Total score	37.42 \pm 7.27

Table 4. Maslach Burnout Inventory-General Survey (MBI-GS) scores for otolaryngology nurses.

Dimension	Median	First quartile (Q1)	Third quartile (Q3)
Emotional exhaustion	10.00	6.00	14.00
Cynicism	5.00	2.00	8.00
Feeling of low achievement	11.50	2.75	18.00
Total score	30.00	14.00	41.25

16.72 \pm 3.06, pointing to potential deficiencies in team dynamics. On the other hand, mental flexibility scored 24.18 \pm 4.70, indicating strong adaptability in coping with workplace demands, and self-efficacy scored 24.68 \pm 4.34, demonstrating high confidence in professional capabilities. Finally, the subjective well-being dimension scored 19.19 \pm 3.96, suggesting a moderately positive perception of life quality. Overall, these findings highlight the need to prioritize improvements in psychological safety and team relationships to enhance the mental health and well-being of otolaryngology nurses (Table 2).

CPSS-14 Scores for Otolaryngology Nurses

The CPSS-14 assessment revealed a total average score of 37.42 \pm 7.27 for the 218 otolaryngology nurses, indicating moderate perceived psychological stress among the participants. Detailed analysis of the two dimensions offered additional insights. The tension dimension scored 18.61 \pm 4.98, suggesting that nurses experience significant stress levels, which may hinder their ability to perform effectively in demanding roles. Similarly, the out-of-control dimension scored 18.80 \pm 6.01, reflecting feelings of instability and uncertainty in managing their responsibilities. Overall, these results highlight the psychological challenges faced by otolaryngology nurses, especially in managing stress and a sense of control, which could impact

their professional performance and overall well-being. Addressing these stressors is crucial to mitigate their adverse effects and promote a healthier workplace environment (Table 3).

Table 5. Significance of factors affecting mental health, perceived stress, and burnout.

Factor	Mental health	Stress perception	Burnout
Sex	0.364	0.093	0.930
Hospital-level	0.560	0.261	0.108
Marital status	0.223	0.477	0.585
Family's understanding of work	<0.001**	<0.001**	<0.001**
Outbound support situation	0.444	0.539	0.713
COVID-19 test status	0.004**	0.019*	0.029*
Department staffing situation	<0.001**	0.187	0.130
Work type	0.988	0.667	0.691
Delay in getting off work	0.151	0.163	0.113
Frequency of caring for critically ill patients	0.018*	0.228	0.089
Teamwork satisfaction	<0.001**	<0.001**	<0.001**
Job satisfaction	<0.001**	<0.001**	<0.001**
Intention to leave	<0.001**	0.008**	<0.001**

Note: * $p < 0.05$, ** $p < 0.01$ (statistically significant). COVID-19, coronavirus disease 2019.

MBI-GS Scores for Otolaryngology Nurses

The results of the MBI-GS indicated an overall median score of 30.00 for the 218 otolaryngology nurses, with a first quartile (Q1) of 14.00 and a third quartile (Q3) of 41.25, reflecting considerable variability in burnout levels among participants. Analysis of individual dimensions revealed that the emotional exhaustion dimension had a median score of 10.00 (Q1 = 6.00, Q3 = 14.00), indicating that while some nurses experienced minimal emotional fatigue, others reported higher levels of exhaustion. The cynicism dimension had a median score of 5.00 (Q1 = 2.00, Q3 = 8.00), indicating relatively low levels of cynicism with some variability among respondents. The low achievement dimension exhibited a median score of 11.50 (Q1 = 2.75, Q3 = 18.00), demonstrating a diverse range of perceptions regarding personal accomplishment. These findings underscore the varying degrees of burnout across emotional exhaustion, cynicism, and perceived achievement, highlighting the need for targeted interventions to enhance the psychological well-being of otolaryngology nurses (Table 4).

Significance of Influencing Factors on Mental Health, Stress Perception, and Burnout

The Kruskal-Wallis test identified several factors significantly influencing mental health, perceived stress, and burnout among otolaryngology nurses. Nurses with family members who understood their work reported significantly better mental health, lower stress, and reduced burnout ($p < 0.001$). COVID-19 testing status also influenced outcomes; nurses who tested positive or were untested exhibited higher mental health, stress, and burnout levels compared to those consistently test-

Table 6. Correlations between mental health, perceived stress, burnout, and various dimensions.

Dimension	Tension	Feeling out of control	Emotional exhaustion	Cynicism	Feeling of low achievement	Stress perception	Burnout
Emotional state	−0.462**	−0.204**	−0.531**	−0.493**	−0.235**	−0.432**	−0.465**
Psychological safety	−0.236**	−0.300**	−0.362**	−0.412**	−0.361**	−0.330**	−0.454**
Positive relationship	−0.245**	−0.384**	−0.431**	−0.555**	−0.497**	−0.387**	−0.576**
Mental flexibility	−0.367**	−0.447**	−0.500**	−0.602**	−0.500**	−0.512**	−0.622**
Self-efficacy	−0.324**	−0.442**	−0.483**	−0.615**	−0.572**	−0.478**	−0.656**
Subjective well-being	−0.328**	−0.430**	−0.556**	−0.567**	−0.438**	−0.469**	−0.598**
Mental health	−0.415**	−0.417**	−0.565**	−0.626**	−0.480**	−0.525**	−0.646**

Note: ** $p < 0.01$ (statistically significant).

ing negative ($p < 0.05$). Departmental staffing adequacy emerged as a key factor, with insufficient staffing linked to poorer mental health scores ($p < 0.001$). Frequent care for critically ill patients (7 days or more monthly) was associated with significantly lower mental health scores compared to nurses with fewer critically ill patients ($p < 0.05$). Furthermore, teamwork and job satisfaction were positively correlated with improved mental health and lower stress perception and burnout levels ($p < 0.001$). Conversely, nurses considering resignation within the next year reported significantly higher stress and burnout compared to those with no resignation plans ($p < 0.01$) (Table 5) (Supplementary materials).

Correlation between Mental Health, Perceived Stress, and Burnout Across Dimensions

Spearman correlation analysis revealed a significant negative correlation between the total mental health scale score and the tension dimension score ($r = -0.415$), the sense of loss of control dimension score ($r = -0.417$), and the total score of the Perceived Stress Scale ($r = -0.525$, all $p < 0.01$). Additionally, mental health scores were negatively correlated with emotional exhaustion ($r = -0.565$), cynicism ($r = -0.626$), low achievement dimension ($r = -0.480$), and the total burnout score ($r = -0.646$, all $p < 0.01$, Table 6).

Multiple Linear Regression Analysis of Factors Influencing Mental Health Status

Multiple linear regression analysis showed that emotional exhaustion ($\beta = -0.922$, $p < 0.001$), low achievement ($\beta = -0.623$, $p < 0.001$), and departmental staffing levels ($\beta = -2.769$, $p = 0.007$) had significant negative impacts on the mental health status of otolaryngology nurses. Conversely, teamwork satisfaction ($\beta = 5.516$, $p = 0.001$) and job satisfaction ($\beta = 5.032$, $p = 0.006$) positively impacted mental health outcomes. These findings highlight the importance of mitigating burnout and ensuring adequate staffing while promoting teamwork and job satisfaction to improve the mental health status of otolaryngology nurses (Table 7).

Table 7. Multiple linear regression analysis results.

Factor	β	95% Confidence interval (CI)	<i>t</i> -value	<i>p</i> -value
Emotional exhaustion	-0.922	(-1.274, -0.570)	-5.123	<0.001
Feeling of low achievement	-0.623	(-0.844, -0.402)	-5.493	<0.001
Departmental staffing levels	-2.769	(-4.747, -0.791)	-2.738	0.007
Teamwork satisfaction	5.516	(2.228, 8.804)	3.287	0.001
Job satisfaction	5.032	(1.514, 8.550)	2.793	0.006

Discussion

With the progression of new coronavirus prevention and control efforts, the domestic pandemic in China has transitioned from localized outbreaks to sporadic cases. The Chinese pandemic prevention and control measures have achieved substantial success, marking the conclusion of intensive pandemic management. This success is inseparable from the efforts of medical staff, who served as the backbone of pandemic prevention. However, as frontline responders, medical staff face an elevated risk of infection and immense work-related pressures. Nurses are vulnerable to severe emotional stress arising from the intersection of professional, familial, and social responsibilities, which negatively impact their physical and mental health, as well as their job performance (Qutishat, 2024).

Otolaryngology nurses encounter distinct stressors that set them apart from their peers in other specialties. Their work involves managing acute and chronic conditions affecting the head and neck, critical to essential functions like breathing, swallowing, and communication (Balakrishnan et al, 2021). These cases often demand intensive pre- and post-operative care, complex therapeutic management, and emotionally challenging interactions with patients and families. These factors and procedural complexity heighten their psychological burden (Prasad et al, 2020). Additionally, otolaryngology nurses face increased exposure to occupational hazards, such as airborne pathogens, due to the nature of their specialty (Yang et al, 2021).

The findings of this study revealed significant factors influencing the mental health, stress perception, and burnout of otolaryngology nurses. Variables such as departmental staffing, teamwork, job satisfaction, and resignation plans were identified as key determinants. Notably, the mental health scale scores were negatively correlated with tension, sense of loss of control, and overall stress perception scores. Nurses reported reduced perceived stress and burnout in environments with strong collaboration and a positive team culture. These findings align with social support theories, which suggest that collegial support buffers against workplace stress (Kokoroko and Sanda, 2019). For otolaryngology nurses, who frequently handle high-stress and high-risk cases, a collaborative team environment offers essential emotional and practical support, alleviating feelings of isolation and overwhelm (Fang et al, 2018).

Job satisfaction emerged as another crucial factor influencing mental health. Nurses who reported higher satisfaction with their roles demonstrated better men-

tal health outcomes. This correlation underscores the importance of fulfilling patient interactions, opportunities for professional growth, and recognition of achievements in enhancing resilience and overall well-being (Zborowska et al, 2021). To promote job satisfaction, healthcare organizations should prioritize initiatives such as professional development programs, formal recognition of achievements, and flexible work schedules where possible.

The data further revealed that family support and COVID-19 testing status significantly impact the mental health of otolaryngology nurses. Nurses with family members who understand and support their work reported better mental health, highlighting the significance of external social support in mitigating occupational stress. Family understanding likely provides emotional relief and validation, which buffers against the pressures of demanding work environments (Tian et al, 2021). COVID-19 testing status also emerged as a critical factor, with nurses who tested positive or remained untested reporting higher levels of stress and burnout compared to those consistently testing negative. These findings reflect the ongoing impact of the pandemic on healthcare workers, wherein fears of infection and the dual responsibility of ensuring patient and personal safety exacerbate stress (Murat et al, 2021). Addressing these concerns requires ongoing access to protective equipment, regular testing, and mental health interventions tailored to pandemic-related anxieties.

Another significant factor affecting mental health was the frequency of caring for critically ill patients. Nurses providing critical care for severely ill patients for seven or more days per month reported lower mental health scores. Managing critically ill patients involves increased emotional labor, amplifying stress levels. To address these challenges, healthcare facilities should offer targeted psychological support and ensure structured downtime for these nurses to facilitate emotional recovery (Levi and Moss, 2022).

The concept of occupational burnout has been a subject of research since the 1970s, with American clinical psychologist [Freudenberger \(1974\)](#) first defining burnout in 1974. He described it as emotional exhaustion, physical and mental fatigue, weakened self-efficacy, and reduced work accomplishment resulting from the prolonged depletion of personal resources due to excessive occupational demands. Occupational burnout is a delayed reflection of chronic emotional strain and interpersonal stress resulting from high expectations and unrelieved work pressures. Among nurses, burnout is common and harmful, necessitating a deeper understanding of its influencing factors and the implementation of targeted intervention. Research on burnout, domestic and international, has primarily focused on individual, psychological, and organizational factors. Individual factors include gender, years of nursing experience, education level, employment status, departmental characteristics, and other demographic variables ([Raftopoulos et al, 2012](#)). Studies comparing healthcare systems and cultural attitudes toward mental health have revealed that systemic factors also play a pivotal role in shaping the well-being of nurses. For instance, countries with well-established mental health systems for healthcare workers tend to have lower burnout rates, whereas those with under-

staffing issues and limited access to mental health resources report higher levels of stress and burnout among nurses (Varghese et al, 2021).

In our study, Spearman correlation analysis revealed that mental health is negatively correlated with perceived stress and burnout, including emotional exhaustion, cynicism, and low achievement. This negative relationship suggests that as stress and burnout increase, mental health deteriorates, emphasizing the urgent need for interventions that target stress reduction and burnout prevention. Potential interventions include resilience training, peer support programs, and organizational measures to mitigate unnecessary stressors.

Burnout has far-reaching implications for individuals and organizations. For individual nurses, burnout often manifests as a detached attitude toward work, reduced confidence, low self-esteem, and a loss of empathy. These changes impact the cognitive and emotional states of nurses, potentially leading to physical and mental illness (Eder and Meyer, 2021). At the organizational level, burnout is closely related to reduced nursing service quality and increased turnover rates. Research has shown that professional burnout decreases job satisfaction and patient care quality, lowering patient satisfaction and driving up healthcare costs (Raftopoulos et al, 2012). High levels of occupational burnout are also associated with increased absenteeism, reduced efficiency, and higher turnover intentions, which further strain healthcare systems (Basar and Basim, 2016).

Our findings highlight emotional exhaustion, feelings of low achievement, and inadequate departmental staffing as critical factors affecting the mental health of otolaryngology nurses. Emotional exhaustion, a core component of burnout, often results from prolonged exposure to job stress, especially in demanding healthcare settings (van Mol et al, 2015). Otolaryngology nurses frequently face intense clinical scenarios and challenging patient interactions, making them vulnerable to psychological strain and decreased job satisfaction. These findings are consistent with the Job Demands-Resources (JD-R) model, which suggests that high job demands combined with insufficient resources contribute to burnout and psychological distress (Bakker and de Vries, 2021).

Feelings of low achievement also negatively impact mental health, as nurses who perceive limited personal or professional accomplishments may experience reduced motivation and self-worth. These observations align with Maslach and Leiter's burnout theory, which emphasizes that a lack of recognition or a sense of accomplishment can erode the sense of purpose for an individual (Maslach and Leiter, 2008). In otolaryngology nurses, the complexity of managing patients with chronic or complex conditions may hinder the attainment of a sense of closure or success, impacting their overall well-being (Carlson et al, 2021). Addressing these challenges requires interventions that acknowledge and validate the achievements of individual nurses and establish clear pathways to career development.

Additionally, inadequate departmental staffing exacerbates workload pressures, contributing to greater stress, reduced care quality, and poor mental health outcomes. Addressing staffing shortages by improving resource allocation and personnel could alleviate these pressures. Adequate staffing reduces individual work-

loads and allows nurses more time to engage with patients and prioritize self-care, potentially mitigating burnout and improving overall job satisfaction.

In terms of psychological factors, research has highlighted that individuals with stubborn, externally controlling, and type A personalities are more susceptible to burnout (Chen et al, 2023; Duan-Porter et al, 2018). This susceptibility may be related to emotional fragility and a tendency to experience a low sense of accomplishment when faced with work setbacks. Our Spearman correlation analysis revealed that the dimensions of emotional exhaustion, cynicism, low achievement, and total burnout scale scores are negatively correlated with mental health outcomes. Similarly, a study has identified significant differences in burnout scores among nurses with varying personality traits (Pérez-Fuentes et al, 2019). Nurses with high neuroticism, low agreeableness, and low conscientiousness are more vulnerable to negative emotions, while those with adaptable and resilient personalities exhibit lower levels of job burnout (van der Wal et al, 2016).

Further evidence suggests that nurses with neurotic tendencies, high work expectations, elevated interpersonal stress, high self-esteem, and limited patience are particularly vulnerable to burnout (Alfuqaha et al, 2019; Goliroshan et al, 2021). These personality traits often result in emotional instability and difficulty alleviating work-related psychological burdens. Such individuals may also struggle with patience during nurse-patient interactions, exacerbating tensions and increasing professional burnout risk (Liao et al, 2020). Conversely, extroverted, emotionally stable, and optimistic nurses are more likely to experience a sense of job accomplishment and are less prone to burnout (Soleimani et al, 2016). Persistent irritability, anxiety, and restlessness, as documented in some studies, can lead to negative and indifferent attitudes toward work and a tendency to depersonalize, further contributing to burnout (Khamisa et al, 2017).

Given these findings, it is imperative to actively support the physical and mental health of otolaryngology nurses. Encouraging self-psychological adjustments, implementing effective incentive systems, such as increased leave allowances, and leveraging the positive effects of social support can help alleviate workplace pressures. By fostering opportunities for rest and recovery, nurses can re-engage with their roles and return to their families and clinical work in a better physical and mental health state.

This study was conducted in the post-COVID-19 period, aiming to provide insights for nursing managers to improve the mental health of nurses during future major infectious disease outbreaks. A key strength of the study is its focus on the mental health and burnout dimensions among otolaryngology nurses, a relatively underexplored population. However, several limitations must be acknowledged. The cross-sectional design restricts causal inferences, preventing us from establishing temporal relationships between workplace stressors and mental health outcomes. Furthermore, the regional scope of the study limits the generalizability of findings across diverse geographical and cultural settings. Finally, the reliance on self-reported data introduces the possibility of reporting bias, as participants may underreport or exaggerate psychological distress due to stigma or recall inaccuracy.

cies. These limitations highlight caution in interpreting our findings and underscore the need for longitudinal and multi-region studies in future research.

Future research should prioritize investigating targeted psychological interventions to enhance the mental health of otolaryngology nurses. Cognitive Behavioral Therapy, for instance, could be investigated for its effectiveness in addressing maladaptive thought patterns and alleviating symptoms of anxiety and depression. Stress management programs, including mindfulness training and resilience-building workshops, warrant exploration of their potential to enhance coping mechanisms and mitigate burnout. Understanding the mechanisms underlying these interventions, such as their influence on neurobiological pathways or psychological resilience, will be crucial for tailoring these strategies to the unique post-pandemic challenges faced by otolaryngology nurses.

Conclusion

This study offers valuable insights into the mental health, stress perception, and burnout experienced by otolaryngology nurses, especially within the context of the COVID-19 pandemic. The findings underscore the significant impact of emotional exhaustion, a sense of low achievement, and insufficient staffing on mental health and burnout risk. Conversely, strong teamwork, high job satisfaction, and robust family support emerged as protective factors that alleviate stress and improve mental health outcomes. The unique demands of otolaryngology nursing, such as managing conditions that affect essential functions like breathing, swallowing, and communication, impose additional psychological burdens. These challenges are further exacerbated by elevated exposure to airborne pathogens inherent in this specialty. The analysis highlights the urgent need for targeted interventions, including optimized staffing levels, structured mental health support, and professional development opportunities that recognize and validate contributions from nurses. Implementing these measures is essential to fostering a supportive work environment, reducing stress, and preventing burnout among otolaryngology nurses.

Key Points

- Nurses who tested positive or remained untested experienced significantly higher levels of stress and burnout compared to those with consistently negative test results ($p < 0.05$).
- Although initially hypothesized as a critical factor, the current analysis revealed no statistically significant association between staffing adequacy and stress or burnout, with p -values of 0.187 and 0.130, respectively.
- Increased anxiety and depression were observed among nurses with positive or unknown COVID-19 status, emphasizing the need for targeted mental health interventions.
- These findings underscore the importance of regular COVID-19 testing and adequate staffing in mitigating stress and improving mental health outcomes for nursing staff during public health emergencies.

Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding authors upon reasonable request.

Author Contributions

XY, RY and HZ designed the research study. XY performed the research. RY and HZ provided help and advice on the research. XY analyzed the data. XY, RY and HZ drafted the manuscript. All authors contributed to the important editorial changes in the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

This study was conducted in accordance with the Declaration of Helsinki. Ethical clearance for this study was granted by the Ethics Committee of West China Hospital, Sichuan University, with an exemption based on compliance with the relevant policy regulations, including the National Guidelines for Ethical Conduct in Research Involving Human Subjects. Additionally, informed consent was obtained from all participating nurses.

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Conflict of Interest

The authors declare no conflict of interest.

Supplementary Material

Supplementary material associated with this article can be found, in the online version, at <https://www.magonlinelibrary.com/doi/suppl/10.12968/hmed.2024.0770>.

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