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ORIGINAL

EVALUATING THE RELATIONSHIPS BETWEEN JOB EFFICACY, MENTAL HEALTH, AND BURNOUT AMONG NURSING STAFF IN INTERVENTIONAL OPERATING ROOMS: IMPLICATIONS FOR HIGH-PERFORMANCE HEALTHCARE TEAMS

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ABSTRACT

Objective: To analyze the correlation of job efficacy, mental health and job burnout of nursing staff in interventional operating room. **Methods:** A total of 110 nursing staff in the interventional operating room from August 2020 to February 2023 were selected as the observation objects, and all of them were evaluated by Symptom Checklist-90 (SCL-90), Job Efficacy Scale, and Marquis Burnout Inventory (MBI) to assess their mental health. According to the MBI scale, they were divided into a mild group (n=33), a moderate group (n=59), and a severe group (n=18) to compare the high and low scores of SCL-90 scale and job efficacy scale. Pearson correlation was used to analyze the correlation among job efficacy scale of nursing staff, SCL-90 scale and MBI scale. **Results:** A total of 100 nursing staff of interventional operating room were all performed by SCL-90 scale with a total score of (222.68 ± 28.61), job efficacy scale with a total score of (23.37 ± 2.58), and MBI scale with a total score of (7.90 ± 1.04). The proportion of mild, moderate and severe job burnout accounted for 30.00%, 53.64% and 16.36% respectively. The low scores of job efficiency of nursing staff in the severe group of job burnout accounted for 83.33%, which was significantly higher than the mild and moderate groups, accounting for 39.39% and 42.37% respectively; the high scores of job efficiency of nursing staff in the

mild group of job burnout accounted for 69.70%, which was significantly higher than the moderate group and severe group, accounting for 38.98% and 38.89%, respectively and the difference was statistically significant (P<0.05). Pearson correlation analysis showed that job efficacy scale was significantly negatively correlated with MBI scale of nursing staff (r=-0.513, P<0.05), and SCL-90 scale was significantly positively correlated with MBI scale (r=0.627, P<0.05). **Conclusion:** Job burnout of nursing staff in intervention operating room is closely related to job efficacy and mental health. It is suggested to focus on the psychological status and the sense of job efficacy of nursing staff in intervention operating room to create a good professional environment and improve the quality of nursing personnel training.

KEYWORDS: Interventional operating room; Sense of work efficiency; Mental health; Job burnout; Relevance

1. INTRODUCTION

The job burnout period, also known as the occupational exhaustion period, is just a kind of psychological fatigue, which refers to the physical and mental fatigue and an exhausted state of individuals under the pressure of work. The high intensity of work, the incomprehension of family members and patients, and the low welfare benefits of nurses are more likely to make them enter the job burnout period. Job burnout refers to an extreme reaction caused by staff's inability to adapt the work pressure, and it is the exhaustion of staff's emotions, behaviors and attitudes under long-term pressure (Suleiman‐Martos et al., 2020; White et al., 2021). With the rapid development of medical care in recent years, the pace and efficiency of hospital work have been continuously improved. With the renewal of patient-centered nursing concept, the continuous enhancement of patients' self-protection awareness, the increasingly strict requirements of nursing work, the unscientific allocation and division of labor of nurses' human resources, and the increasingly heavy psychological and physical load of nurses, the phenomenon of "job burnout" has become more common. Nurses are often characterized by insomnia, headache, gastrointestinal dysfunction, irritability and other symptoms, and there is a serious imbalance of nursing staff and nursing service demand, leading to the situation of the job burnout being gradually increased in nursing staff (Bogue & Bogue, 2020; Suleiman‐Martos et al., 2020).

The nursing staff in the intervention operating room are a group engaged in the special nursing career, with the characteristics of strong professionalism, heavy work, high exposure risk, and high work pressure, etc., but the long-term high intensity and the complexity of the working environment can gradually diminish the enthusiasm of the nursing staff, reduce the quality of the nursing staff's work, and ultimately lead to the sense of job burnout of the nursing staff (Czeglédi & Tandari-Kovács, 2019; Li et al., 2021). Some scholars (Jun et al.,

2021; Murat et al., 2021) believe that there is a certain relationship between job efficacy and job burnout of nursing staff. Workplace violence is related to job burnout, job satisfaction reduction, poor patient safety and adverse events. Nurses' job burnout and job satisfaction have a significant mediating effect among workplace violence and overall patient safety and adverse events (Adams et al., 2019; Jessica Taylor & Marylyn Carrigan, 2022; Sriharan et al., 2021). At the same time, the mental health status of nursing staff also affects the job burnout to a certain extent. This study selected 110 nursing staff in interventional operating room from August 2020 to February 2023 as the observation objects to analyze the correlation among the job efficacy, mental health and job burnout.

2. Data and Methods

2.1 General Data

A total of 110 nursing staff in the interventional operating room from August 2020 to February 2023 were selected as the observation objects. The inclusion criteria: ① All of them were the nursing staff in the interventional operating room of 22 hospitals in our province, and the working time in the operating room was ⩾ 3 months; ② All are registered nurses in the hospital; ③ the nurses were informed and able to cooperate with the survey of scales.

Exclusion criteria: ① the nurses who were not working in hospital due to maternity leave, sick leave, etc.; ② the nursing staff who went out for further study.

2.2 Methods

Symptom Checklist (SCL-90) scale (Van der Heijden et al., 2019): Symptom Checklist 90 (SCL-90), sometimes called Hopkin's Symptom List (HSCL, compiled earlier than SCL-90, by the same author, and the first edition of HCSL was compiled in 1954), was prepared in 1975 by L.R. Derogatis. The scale had 90 items in total, including a wide range of psychiatric symptoms, from feeling, emotion, thinking, consciousness, behavior to life habits, interpersonal relationships, diet and sleep, etc., and 10 factors were used to respectively reflect the psychological symptoms of 10 aspects, with a score range of 1, 2, 3, 4, and 5 points.

None: There was no such problem (symptoms) felt by oneself; Very light: There was the problem felt by oneself, but not frequently and seriously; Medium: There was the symptom felt by oneself, and the degree of which was light to moderate; Kind of serious: There was often the symptom felt by oneself and the degree of which was moderate to severe;

Serious: The frequency and intensity of the symptom was very serious.

In the total score, less than 45 points were low points, and more than or equal to 45 points were high points. The higher the score, the worse the psychological status of the nursing staff.

Job efficacy scale: It was used to evaluate the job efficacy of nursing staff, including work ability, work enthusiasm, and patient satisfaction. The score range was 0-10 points, the total score under 15 points was low scores, and more than or equal to 15 points were high scores. The higher the score, the better the job efficacy of nursing staff.

Maslach Job Burnout Questionnaire (MBI) scale (Acosta-Ramos et al., 2021): Maslach Job Burnout Questionnaire (MBI) was jointly developed by American social psychologists Maslach and Jaskson used to evaluate the job burnout of nursing staff, including depersonalization, emotional exhaustion, and low sense of accomplishment. There were 22 questions in total, with the score range of 1, 2, 3, and 4, of which 1-2 points were mild and 2.1-3.0 points were moderate, 3.1-4 points were severe, 3-6 points were mild, 6.1-9 points were moderate, and 9.1-12 points were severe.

2.3 Observation Indicators

① The scores of SCL-90 scale, work efficacy scale and MBI scale of 110 nursing staff in interventional operation room were collated and analyzed;

② According to the MBI scale, they were divided into a mild group (n=33), a moderate group (n=59), and a severe group (n=18) to compare the high and low scores of SCL-90 and job efficacy scale in each group; ③ Pearson correlation analysis was used to analyze the correlation among nursing staff's job efficacy scale, SCL-90 scale and MBI scale.

2.4 Statistical Methods

The experimental data were analyzed by SPSS20.0 software. SCL-90 scale, job efficacy scale, MBI scale and other measurement data were expressed in the form of ($\bar{x} \pm s$), and *t*-test was used for the comparison between the groups; the high and low scores of the scale and other count data were expressed in the form of (%) and χ^2 was used for test. When $P<0.05$ indicated that the statistical results were statistically significant.

3. Results

3.1 Analysis of the various dimension's scores of mental health of nursing staff in intervention operation room

In this experiment, 110 nursing staff in the intervention operating room were evaluated with SCL-90 scale for their mental health, with a total score of (222.68 ± 28.61), as shown in Table 1 and Figure 1 for details.

Table 1: Analysis of the various dimensions scores of mental health of nursing staff in intervention operation room ($\bar{x} \pm s$)

INDICATOR		SCORE
MENTAL HEALTH	Mental lesion	22.81±3.57
	Anxious	22.98±3.81
	Depressed	21.93±3.45
	Paranoia	25.15±3.69
	Hostile	20.72±2.14
	Terror	21.49±3.72
	Obsession	22.81±3.40
	Interpersonal sensitivity	23.59±3.18
	Somatization	21.84±3.19
	Other	21.22±3.54
	Total score	224.54±11.22

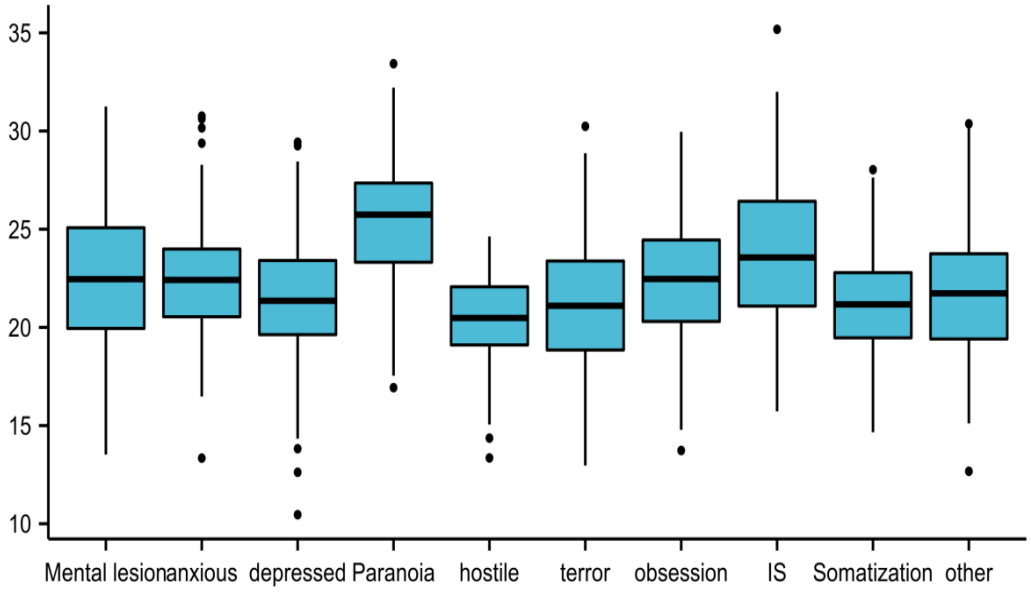

Figure 1: Analysis of the various dimension's scores of mental health of nursing staff in intervention operation room

Note: *Mental lesion: mental lesion; Anxiety: anxiety; Depressed: depression; Paranoia: paranoia; Hostile: hostile; Terror: terror; Obsession: obsession; Interpersonal sensitivity (IS): interpersonal sensitivity; Somatization: somatization; Other: Other.*

3.2 Analysis of the various dimensions' scores of job efficacy of nursing staff in intervention operating room

The nursing staff in this experiment were evaluated by our self-made job efficacy scale, with a total score of (23.37 ± 2.58), as shown in Table 2 and Figure 2 for details.

Table 2: Analysis of the various dimensions scores of job efficacy of nursing staff in intervention operating room ($\bar{x}\pm s$)

INDEX		SCORE
SENSE OF WORK EFFICIENCY	Working Ability	8.06±2.11
	Work Enthusiasm	7.76±2.22
	Patient Satisfaction	7.65±2.34
	Total Score	23.47±3.83

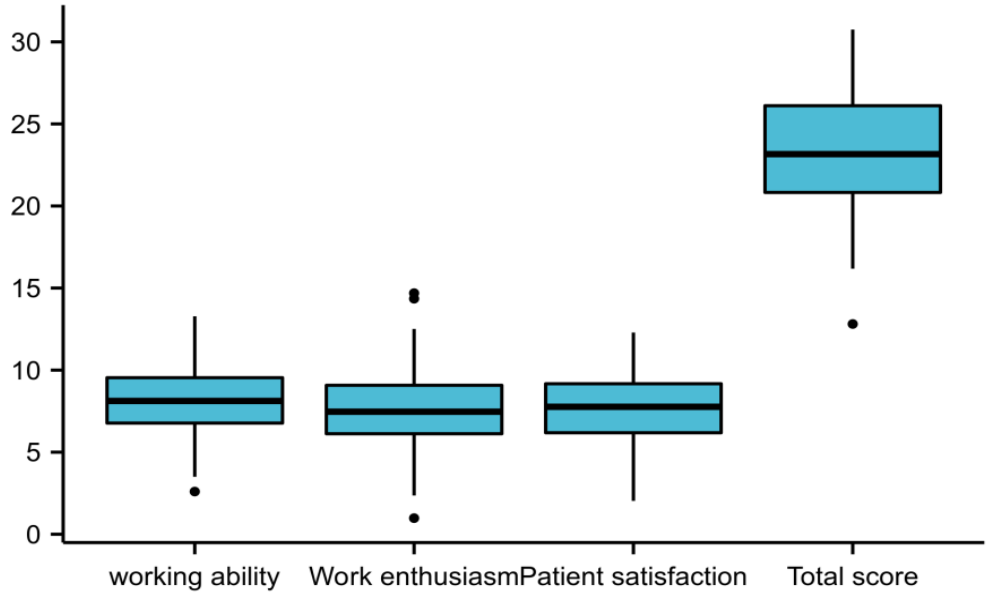

Figure 2: Analysis of the various dimension's scores of job efficacy of nursing staff in intervention operating room

3.3 Analysis of the various dimensions scores of job burnout of nursing staff in intervention operating room

The nursing staff in this experiment were evaluated by MBI scale, and the total score was (7.90 ± 1.04). The mild, moderate and severe job burnout accounted for 30.00%, 53.64% and 16.36% respectively, as shown in Table 3 and Figure 3 and Figure 4 for details.

Table 3: Analysis of the various dimensions scores of job burnout of nursing staff in intervention operating room ($\bar{x}\pm s$)

INDEX		SCORE	JOB BURNOUT		
			light	moderate	severe
JOB BURNOUT	Depersonalization	2.59±0.61	36（32.73）	50（45.45）	24（21.82）
	Emotional exhaustion	3.08±0.92	24（21.82）	45（40.91）	41（37.27）
	Low sense achievement	2.23±0.74	47（42.73）	49（44.55）	14（12.73）
	Total score	7.90±1.37	33（30.00）	59（53.64）	18（16.36）

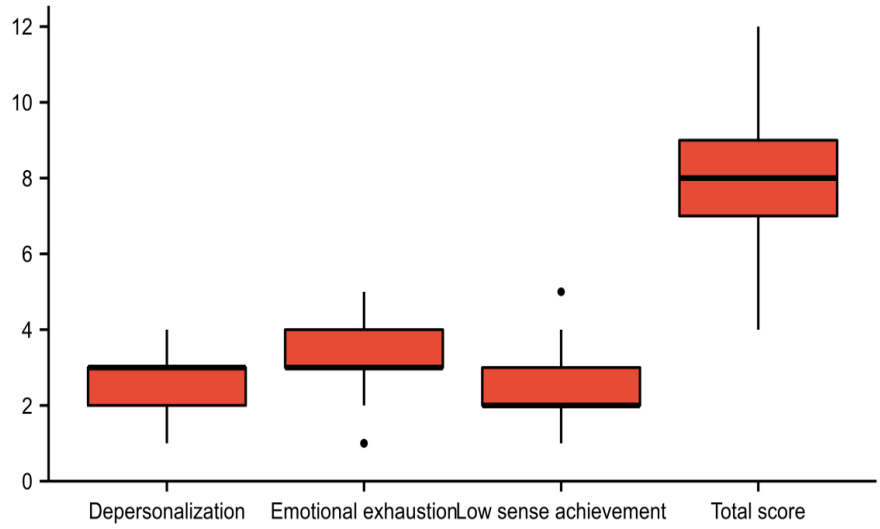

Figure 3: Scores of various dimensions of job burnout of nursing staff in intervention operating room

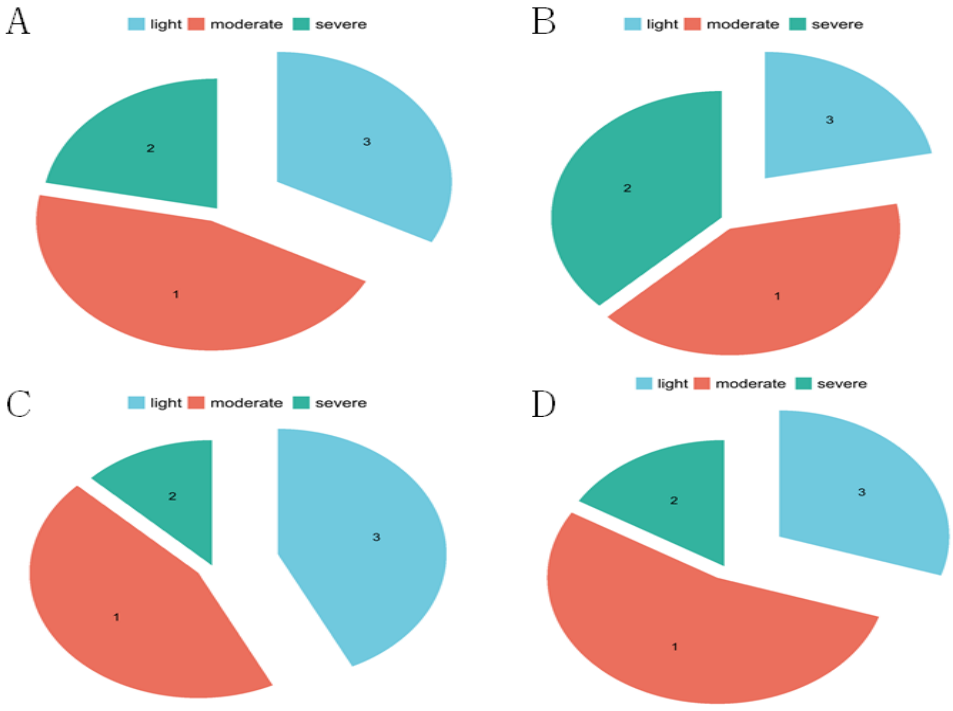

Figure 4: Analysis of the various dimension's scores of job burnout of nursing staff in intervention operating room

3.4 Analysis of job efficacy and mental health of nursing staff with different degrees of job burnout

The low scores of job efficiency of nursing staff in the severe group of job burnout accounted for 83.33%, which was significantly higher than the mild and moderate groups, accounting for 39.39% and 42.37% respectively; the high scores of job efficiency of nursing staff in the mild group of job burnout accounted for 69.70%, which was significantly higher than the moderate group and severe group, accounting for 38.98% and 38.89% respectively and the

difference was statistically significant (P<0.05), as shown in Table 4.

Table 4: Analysis of job efficacy and mental health of nursing staff with different degrees of job burnout (cases, %)

GROUPING	CASE	SENSE OF WORK EFFICIENCY		MENTAL HEALTH	
		High score (n=57)	Low score (n=53)	High score (n=55)	Low score (n=55)
MILD GROUP	33	20（60.61）	13（39.39）	25（75.76）	8（24.24）
MODERATE GROUP	59	34（57.63）	25（42.37）	23（38.98）	36（61.02）
SEVERE GROUP	18	3（16.67）	15（83.33）	7（38.89）	11（61.11）
X^2		10.727		12.511	
P		0.005		0.002	

3.5 Correlation analysis of job efficacy, mental health and job burnout of nursing staff

Pearson correlation analysis showed that job efficacy scale was significantly negatively correlated with MBI scale of nursing staff (r=-0.513, P<0.05), and SCL-90 scale was significantly positively correlated with MBI scale (r=0.627, P<0.05), as shown in Table 5 and Figure 5.

Table 5: Correlation analysis of job efficacy, mental health and job burnout of nursing staff

INDEX		JOB EFFICACY SCALE	SCL-90 SCALE
MBI SCALE	*R*	-0.767	0.320
	P	＜0.001	0.001

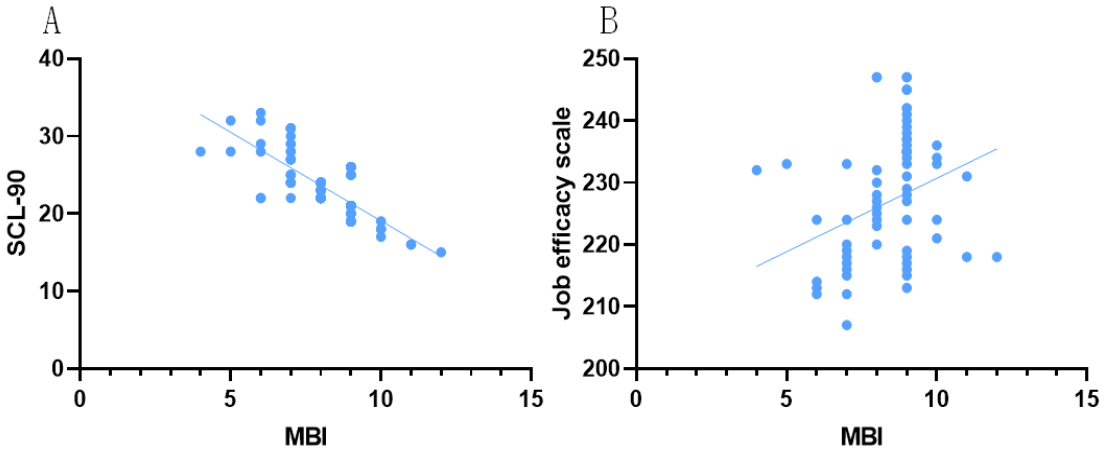

Figure 5: Correlation analysis of job efficacy, mental health and job burnout of nursing staff

4. Discussion

Job burnout is also known as "psychosomatic exhaustion syndrome", that is, job burnout is a delayed response to long-term emotional and interpersonal pressure at work, including three dimensions, namely, emotional

exhaustion, depersonalization and personal achievement reduction. As an important nursing human resource, nurses are an important part of hospital operation. Due to the high risk and particularity of medical service itself, large nursing workload, heavy responsibility, and irregular work, so job burnout is particularly prominent in nurses. The patient-centered nursing model is a complex and creative work, so the nurses need to constantly learn, update their knowledge and improve their skills (Quijada-Martínez et al., 2021; Yeh et al., 2021). The requirements of the hospital on the education background and skills of nursing staff will make them give up their rest time to continue to learn new knowledge and skills, resulting in psychological pressure. This situation seriously affects the physical and mental health of nurses and restricts the development of nursing work. At present, China is generally characterized by insufficient nursing resources, heavy work of nurses, high work pressure, and so on, so job burnout is more likely to occur (Adams et al., 2019; Murat et al., 2021). In Japan, some people have done a survey of nurses' job burnout, the incidence of which is 25.9%; according to the American survey, more than 50% of nursing workers have job burnout (Tsukamoto et al., 2021); the incidence of nurse burnout in China is 55.1%~59.1%. According to previous statistics, about 40% of nursing staff are not satisfied with their current work, and about 20% of nursing staff are ready to resign within one year (Lv et al., 2020). Therefore, the job burnout of nursing staff is serious and has become the focus of hospital management at present. Job burnout includes three aspects in detail: emotional exhaustion, depersonalization and reduced personal accomplishment. Among them, Emotional Exhaustion refers to the individual feeling that the emotional and physical resources are exhausted, mainly manifested as physical and mental exhaustion; Depersonalization refers to an individual's negative, indifferent or overly alienated attitude and reaction to all aspects of work; Reduced personal accomplishment refers to the individual's feeling of incompetence, lack of work efficiency and sense of achievement. These three aspects are usually chronological that emotional exhaustion leads to the depersonalization, and then leads to the reduced personal accomplishment. Interventional operating room is a special nursing unit in the hospital, with poor working environment (under ray), high work risk, high workload and fast work rhythm and at the same time, the nursing staff are required to have high work skills. The construction of interventional compound operating room is not mature, and the construction of operating room, space layout, configuration and management of operating equipment all need the participation of nurses. The operation schedule, the design of compound operation plan, how to use the equipment reasonably and save the operation time need to be coordinated and adjusted by nurses and doctors to confirm that the purpose of the operation requirements is met, facilitate the operation of the operator and ensure the safety and smooth operation (Rivas et al., 2021; Wang et al., 2022). Interventional compound surgery involves many disciplines, a large number of people, and takes a long time. Nurses need to make proper arrangements in

maintaining the cleanliness and sterility of the operating room, monitoring the vital signs of patients, and assisting the doctors on the stage to complete the operation and rescuing the complications during the operation. Therefore, the nurses in the intervention operating room are under great mental and psychological pressure. If they are not given timely intervention, the negative emotions in the work will be increased and the work initiative will be reduced, leading to low work efficiency and poor work quality (Labrague & de Los Santos, 2021; Salvarani et al., 2019; Urso et al., 2022). This experimental study found that the moderate and severe job burnout of nursing staff in this experiment was as high as 57.55%, mainly reflected in depersonalization, emotional exhaustion and other aspects. There was a certain difference with the relevant (Kim et al., 2019) research results, which might be related to regional differences and hospital environment. The working nature and working environment of the intervention operating room are relatively special. The nursing staff work in radiation settings, often contact with sharp instruments and polluting substances and the risk of occupational exposure is higher, and the psychological pressure of the nursing staff is higher, so the physical and mental fatigue is easy to occur (Gao et al., 2022; While & Clark, 2021). The sense of work efficacy refers to the degree of confidence that an individual is competent for a certain job. The higher the sense of work efficacy, the higher the individual's enthusiasm and enthusiasm for work. And the research believes that job efficacy is related to job burnout (Sriharan et al., 2021). In this experiment, the low scores of job efficiency of nursing staff in the severe group of job burnout group accounted for 83.33%, which was significantly higher than the mild and moderate group, accounting for 39.39% and 42.37%, respectively; the high scores of job efficiency of nursing staff in the mild group of job burnout accounted for 69.70%, which was significantly higher than the moderate and severe groups, accounting for 8.98% and 38.89%, respectively. It shows that there is a certain relationship among job efficacy and mental health status of nursing staff and job burnout, which is similar to the results of relevant research (Kakemam et al., 2021). The study also believes that reducing self-regulation fatigue level and improving job efficacy are conducive to alleviating job burnout. Nursing staff with job burnout often have a lower sense of self-efficacy, which means that they tend to evaluate themselves negatively, accompanied by a decline in work ability experience and achievement experience. They think that the work not only cannot exert their talents, but also is boring and tedious, and they often have a sense of powerlessness. Previous studies believed that when nurses were emotionally unstable, the nursing business trip rate was as high as 60%, so they were impossible to predict the potential hidden dangers of patients in advance and give early treatment, which would affect the prognosis of patients to a certain extent and cause adverse effects on the nurse-patient relationship (Gayol & Lookingbill, 2022). Therefore, it is necessary to analyze the inducing factors of job burnout of nursing staff early to correct these factors timely and effectively, and monitor the factors regularly, which will help improve

the working efficiency of nursing staff and improve the nurse-patient relationship. Pearson correlation analysis of this experiment showed that the job efficacy scale of nursing staff was significantly negatively correlated with the MBI scale, and the SCL-90 scale was significantly positively correlated with the MBI scale, which further shows that nursing staff with poor mental health and low work efficacy are more likely to have job burnout, so the effective adjustment of work environment and attention to the psychological status of nursing staff will help to reduce the incidence of job burnout. The nursing work is trivial and heavy, which can be called "mechanized production and assembly line operation" and over time, the body is tired, the mind is exhausted, and the dull work leads to boredom, which leads them to enter emotional dead-end (Adarkwah & Hirsch, 2020). So the nursing staff should cultivate good work habits, learn from excellent colleagues, plan their work reasonably to complete it in an orderly manner, maintain a careful and rigorous work attitude, discover the joy of work, and maintain a fresh sense of work. In a word, job burnout is coming and the nursing staff should continue to strengthen their study, broaden their horizons, improve their professional ability and level to overcome their burnout psychology, devote themselves to nursing work with full spirit, adhere to their original mission, unswervingly, and meet new challenges and opportunities with the best state. To sum up, the job burnout of the nursing staff in the intervention operating room is closely related to the sense of work efficacy and mental health. So attention should be paid to the psychological status and sense of work efficacy of the nursing staff in the intervention operating room to create a good professional environment and improve the quality of nursing personnel training. However, due to the short time of this experimental study, the impact of adjusting the sense of work efficacy and mental health status of nursing staff in the intervention operating room on job burnout has not been analyzed. In the future, the experimental time will be increased for in-depth exploration.

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