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Research Article

The Effect of Work Connectivity Behaviors on Work-Family Conflict among Operating Room Nurses - The Mediating Role of Psychological Disengagement

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Abstract

Objective: To analyze the effect of work connectivity behavior of operating room nurses on work-family conflict based on the mediating role of psychological disengagement. **Design**: A Cross-Sectional Analysis. **Methods:** A general information questionnaire, work-family conflict scale, psychological disengagement scale, and work-based communication tool usage scale were used to make an online questionnaire star questionnaire to survey 102 nurses in the operating room of a tertiary hospital in Guangzhou City using convenience sampling method, and a bias-corrected percentile Bootstrap test was used to analyze the impact of work connectivity behavior on work-family conflict and the mediating role of psychological disengagement in it. The mediating role of psychological disengagement. **Results:** The total scores of work connectivity behavior, work-family conflict, and psychological disengagement of the operating room nurses were (10.53±1.89), (55.29±10.03), and (10.61±3.21), respectively. Work connectivity behavior was positively correlated with work-family conflict ($r=0.353$, $P<0.01$) and negatively correlated with psychological disengagement ($r=-0.259$, $P<0.01$); psychological disengagement was negatively correlated with work-family conflict ($r=-0.293$, $P<0.01$). The mediating effect of psychological disengagement between mind-work connectivity behavior and work-family conflict in operating room nurses was 0.049 (95% CI: 0.004-0.114), accounting for 15.8% of the total effect. **Conclusion:** Work-family conflict among operating room nurses was at a high level, and work-connecting behavior among operating room nurses positively predicted work-family conflict, in which psychological disengagement played a mediating role**.**

Keywords: Operating room nurse; Work-family conflict; Psychological disengagement; Work connectivity behaviors

Introduction

Work-family conflict among operating room nurses is at a moderately high level, and operating room nurses often face high loads, high risks, and high emotional work environments due to the nature of their work, which leads to difficulties in striking a balance between their work and family life [1].Work connectivity behavior refers to the actions of individuals who, during their off-duty hours and in any location, participate in work through communication methods such as WeChat, QQ, phone calls, text messages, emails, etc., while also undertaking multiple roles in life [2].Work-family conflict refers to the situation where pressures from both the work and family spheres create irreconcilable contradictions in certain aspects, making it more difficult to engage in work (family) roles due to the involvement in family (work) roles [3].The nursing profession, influenced by traditional values, the nature of work, and its characteristics, faces significant work-family conflicts, affecting the quality of work and life, and even leading to job burnout and the intention to leave the profession [4-5].Studies have indicated that work connectivity behavior enhances the work efficiency and convenience of medical staff. However, it also leads to the continuous consumption of physical and mental resources among nursing personnel after work hours, blurring the boundaries between work and family life [6], which is an important factor leading to work-family conflict. Psychological detachment refers to the psychological state where an employee, after work, disengages from work in both time-space and psychological dimensions, no longer being disturbed by work-related matters and ceasing to continue thinking about work [7]. Portable communication devices are used for work connectivity behavior during non-working hours, the less psychological detachment is achieved [8]. Furthermore, psychological detachment can enhance the boundary effect between work and family, playing a positive role in reducing work-family conflict [9]. Therefore, work connectivity behavior is likely to affect work-family conflict through psychological detachment. Consequently, this study hypothesizes that operating room nurses can alleviate work-family conflict by reducing work connectivity behavior and increasing levels of psychological detachment. If the hypothesis is established, it will assist managers in taking targeted measures to improve the work-family conflict of operating room nurses.

Objects and Methods

Research object

The study employed a convenience sampling method and selected 102 operating room nurses from a tier-A hospital in Guangzhou from December 2023 to February 2024 as research subjects. Among them, there were 14 male and 88 female nurses; in terms of professional titles, there were 29 senior nurses, 69 staff nurses, and 4 registered nurses. The study was approved by the hospital's administrative department. Inclusion criteria were: 1) Holding the corresponding qualification certificates and being registered and on duty; 2) Having worked continuously in the operating room for at least one year. Exclusion criteria were: 1) Operating room nurses who were not working in the hospital during the survey period, including those on maternity leave, personal leave, sick leave, etc.

Research Tools

General Information

The demographic characteristics were designed by the research team based on relevant studies, and the questionnaire items include gender, age, years of work experience, education level, professional title, position, marital status, children, personnel relations, monthly night shifts and overtime, and satisfaction with income, totaling 12 items.

Work-Family Conflict Scale

The Work-Family Conflict Scale translated and revised by Zhang Hemiao [10] was adopted. This scale consists of 18 items that form three dimensions: time-based conflict, strain-based conflict, and behavior-based conflict. A Likert 5-point scoring method is used, with a total score range of 18 to 90 points. The lower the score, the lower the level of work-family conflict. The overall scale's Cronbach's α coefficient is 0.96, and the Cronbach is α coefficients for the three dimensions are 0.93, 0.93, and 0.94, respectively.

Psychological Detachment Scale

The Psychological Detachment Scale was adopted from the Recovery Experience Questionnaire developed by Sonnentag [11]. This questionnaire is a unidimensional scale that includes 4 items, scored on a 5-point scale. Higher scores indicate a higher degree of psychological detachment. The original scale's alpha coefficient is 0.84, and the alpha coefficient for this study is 0.80.

Work-Related Communication Tool Usage Scale

Based on the research by BOSWELL [12], Zhang Xiaoxiang et al. [8] developed the Work-Related Communication Tool Usage Scale in accordance with the national conditions of China. This scale consists of 3 items, including active sending behavior, passive receiving behavior, and non-interactive behavior. It uses a Likert 5-point scoring system, where 1 represents "Never" and 5 represents "Very frequently." Higher scores indicate more frequent use of work-related communication tools during non-working hours. The Work-Related Communication Tool Usage Scale has good reliability and validity, with a Cronbach is α

coefficient of 0.83 for the scale. In this survey, the Work-Related Communication Tool Usage Scale was used to measure the level of work connectivity behavior among the participants.

Data Collection Method

In this study, after ethical review and approval by the hospital, the researcher personally entered all items into the Questionnaire Star platform and distributed them in the form of an electronic questionnaire to individuals. The purpose and significance of the study were explained on the first page of the questionnaire, and it was informed that the study was completely anonymous. Survey subjects could anonymously fill in the questionnaire through various devices such as computers, tablets, and mobile phones. All items were set as required to avoid missing items. After the collection of questionnaires, the researcher screened for answers that showed obvious patterns or did not conform to logic to ensure the quality of the questionnaires. A total of 115 questionnaires were distributed in this study, all of which were filled out. After excluding 13 questionnaires with obvious patterns, illogical answers, and submission times less than 180 seconds, a total of 102 valid questionnaires were finally collected, with a valid recovery rate of 91.07%.

Statistical Methods

Data were statistically analyzed using the SPSS 22.0 software package. Categorical data were described using frequency counts and percentages, while continuous data that were normally distributed were described using the mean ± standard deviation. The chi-square test was utilized for testing differences in categorical variables. Pearson correlation analysis was employed to assess the correlation between continuous variables. Mediation effects were analyzed using the Process macro for SPSS, specifically Model 4, developed by Hayes. The bias-corrected percentile Bootstrap method was used for testing, with 5000 resamples to calculate the 95% confidence interval, and the level of significance was set at $\alpha = 0.05$.

Results

General Information

The demographic information of the 102 clinical nurses is presented in (Table 1).

Item	N	Percentage	Item	N	Percentage
1. Age (years).			**7. Marital status**		
≤25	14	13.70%	Single	32	31.37%
26-30	52	51.00%	Unmarried in love	18	17.65%
31-35	13	12.70%	Married without children	14	13.73%
36-40	11	10.80%	Married with children	38	37.25%
≥41	12	11.80%	**8 .Children status**		
2. Sex			No children	64	62.75%
Male	14	13.70%	Only child	15	14.71%
Female	88	86.30%	Second child and above	23	22.54%
3.Work experience (years)			**9.Personnel relationship**		
45296	59	57.80%	Contract system	87	85.29%
45453	17	16.67%	Career establishment	15	14.71%
45611	9	8.82%	**10.Number of night shifts per month**		
16-20	8	7.84%	1-2 times	40	39.22%
≥21	9	8.82%	3-4 times	50	49.02%

4. Academic qualifications			≥5 times	12	11.76%
Undergraduate	100	98.04%	**11. Straight down overtime**		
Graduate students and above	2	1.96%	Hardly	10	9.80%
5. Title			1~2 times a week	47	46.08%
Nurse	4	3.92%	A week ≥ 3 times	30	29.41%
Nurse	69	67.65%	Every day	15	14.71%
Supervisory Nurse	21	20.59%	**12. Income (satisfaction)**		
Associate chief nurse and above	8	7.84%	Very dissatisfied	6	5.88%
6. Position			Less satisfied	9	8.82%
None	54	52.94%	Dissatisfied	26	25.49%
Responsible team leader	38	37.25%	More satisfied	55	53.92%
Nurse manager	10	9.80%	Very satisfied	6	5.88%

Table 1: Demographic Data on Work-Family Conflict among Operating Room Nurses (n=102).

Scores of Operating Room Nurses on Work-Family Conflict, Perceived Organizational Support, and Work Connectivity Behavior

The total score for work connectivity behavior among operating room nurses was (10.53±1.89), the total score for work-family conflict was (55.29±10.03), and the total score for psychological detachment was (10.61±3.21). The scores for each dimension are detailed in (Table 2).

Item	Score Item	Mean Score
Work-Family Conflict	55.29±10.03	3.07±0.56
Time-based conflicts	19.15±3.79	3.19±0.63
Stress-based conflict	18.9±4.58	3.15±0.76
Behavior-based conflict	17.25±4.46	2.87±0.44
Psychological Detachment	10.61±3.21	2.82±0.74
Work Connectivity Behavior	10.53±1.89	3.51±0.63

Table 2: Total Scores and Dimensional Scores of Work-Family Conflict, Psychological Detachment, and Work Connectivity Behavior during Non-Working Hours among Operating Room Nurses (n=102, X±S).

Correlation between Operating Room Nurses' Work-Family Conflict, Perceived Organizational Support, and Work Connectivity Behavior outside Working Hours

The results of the Pearson correlation analysis showed that the work connectivity behavior of operating room nurses was positively correlated with work-family conflict ($r=0.353$, $P<0.01$) and negatively correlated with psychological detachment ($r=-0.259$, $P<0.01$). Psychological detachment was negatively correlated with work-family conflict ($r=-0.293$, $P<0.01$). For more details, see (Table 3).

	Work Connectivity Behavior	Sense of Organizational Support	Psychological Detachment
Work Connectivity Behavior	1		
Sense of Organizational Support	.353**	1	
Psychological Detachment	-.259**	-.293**	1

Table 3: Correlations between Work-Family Conflict, Psychological Detachment, and Work Connectivity Behavior during Non-Working Hours among Operating Room Nurses (n=102).

Examination of the Mediating Effect of Psychological Detachment in the Relationship Between Operating Room Nurses' Work Connectivity Behavior and Work-Family Conflict

The mediation effect of psychological detachment was tested using the Bootstrap method. The results showed that the 95% confidence interval of the direct effect of psychological detachment on job burnout and the mediating effect of empathy did not include 0, indicating that empathy plays a partial mediating role between psychological detachment and job burnout. The mediation effect path diagram is shown in Figure 1. The mediating effect (0.049) and direct effect (0.263) accounted for 15.8% and 84.2% of the total effect (0.312), respectively, as detailed in (Table 4). The above results indicate that the partial mediating effect model of psychological detachment is established, where work connectivity behavior can directly affect work-family conflict and can indirectly affect work-family conflict through the adjustment of psychological detachment.

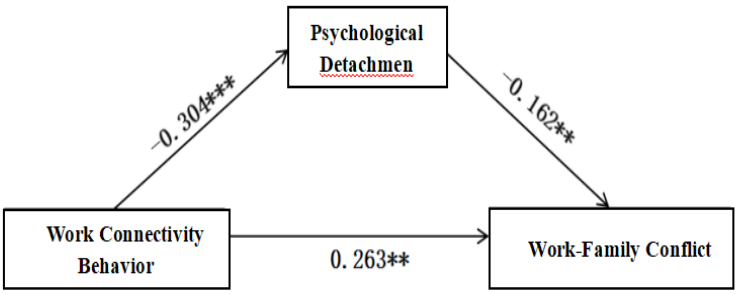

Figure 1: Mediation Model of Psychological Detachment on the Relationship between Work Connectivity Behavior and Work-Family Conflict.

Tem	Effect Size	Standard Error	Bootstrap95%CI		Proportion of Total Effect
			LLCI	ULCI	
Total Effect	0.312	0.083	0.148	0.476	/
Indirect Effect	0.049	0.028	0.004	0.114	0.158
Direct Effect	0.263	0.084	0.097	0.429	0.842

Table 4: Mediation Effect Analysis of Psychological Detachment on the Relationship between Work Connectivity Behavior and Work-Family Conflict among Operating Room Nurses.

Discussion

Current Status of Operating Room Nurses' Work Connectivity Behavior, Psychological Detachment, and Work-Family Conflict

The survey results indicate that the total score for work-family conflict among the 102 operating room nurses was (55.29±10.03) points, which is higher than the moderate intensity value, consistent with the findings of Hou Dandan [13]. Looking at the dimensions, the dimension of time-based conflict had the highest average score, followed by strain-based conflict, and then behavior-based conflict. This may be related to the long continuous working hours of operating room nurses and the unpredictability of their finishing times. It suggests that nursing managers should arrange shifts reasonably according to the work-family conflict situation of operating room nurses, allowing them to balance work and family life as much as possible in terms of time. When necessary, care and emotional support should be provided to help operating room nurses find a sense of belonging in-group interactions.

The score for psychological detachment was (10.61±3.21) points, which is consistent with the research findings of Lu Dezhi et al. [14], indicating that the level of psychological detachment among operating room nurses is at a moderate level. This may be related to the significant reduction in the psychological distance between working time and non-working time in the internet age. It is recommended that managers plan work systematically, clarify division of labor, and avoid disrupting the normal workflow of nurses.

The score for work connectivity behavior was (10.53±1.89) points, which is consistent with the results obtained by Park et al. [15] from their survey of employees across various levels and fields. This may be due to the widespread application of communication technologies such as QQ and WeChat, where it has become a norm for nurses to receive work-related messages, engage in online professional learning, and handle work content during their non-working hours. This suggests that nursing managers should avoid excessively encroaching on the nurses' rest time, which makes it difficult for them to fully recover their physical and mental resources, and should keep work connectivity during non-working hours within a moderate range.

Correlation between Operating Room Nurses' Work Connectivity Behavior, Psychological Detachment, and Work-Family Conflict

Work connectivity behavior is positively correlated with work-family conflict ($r=0.353$, $P<0.01$). This is consistent with the results obtained by Ma Hongyu [16] and others in their survey of enterprise management personnel. The use of work-related communication tools is very common, and the more frequent the work connectivity behavior during non-working hours, the more the nurses' physical and mental investment is in the work field. Consequently, less energy is reserved for the family field, which can affect family life and lead to work-family conflict. Managers can improve work-family conflict by reasonably arranging work, establishing a good communication mechanism, and avoiding disturbing nurses' rest during non-working hours.

Work connectivity behavior is negatively correlated with psychological detachment ($r=-0.259$, $P<0.01$). The more operating room nurses engage in work connectivity behavior during non-working hours, the lower their level of psychological detachment tends to be. It has become a common occurrence for operating room nurses to receive departmental messages, participate in online training, and engage in online professional learning during their time off. This makes it difficult for them to truly disconnect from work. As a result, work demands and pressures are not only present in the workplace and during working hours but also intrude into the private and family domains. Such work connectivity behavior during non-working hours shortens the psychological distance between work and non-work and blurs the boundaries between the two, hindering the nurses' ability to detach from work after hours and affecting their recovery of physical and mental resources as well as the quality of life at work [17]. This suggests that managers should minimize contact with employees during non-working hours to help nurses achieve psychological detachment, allowing operating room nurses to recover physically and mentally after high-intensity work shifts.

Psychological detachment is negatively correlated with work-family conflict ($r=-0.293$, $P<0.01$), which is consistent with the results of Jiang Jingyun [18]. The stronger the psychological detachment ability of operating room nurses, the stronger their ability to detach from negative emotions after work hours and to completely free themselves from thoughts that consume individual psychological resources. This, in turn, reduces the damage of work pressure on physical and mental health and alleviates work-family conflict. It suggests that hospital managers can start by cultivating the psychological detachment abilities of operating room nurses to improve the nurses' work-family conflict. When selecting key personnel for high-workload positions, hospitals should not only consider work ability but also focus on testing their psychological detachment abilities.

The Mediating Effect of Psychological Detachment among Operating Room Nurses in the Relationship between Work Connectivity Behavior and Work-Family Conflict

The results of the mediation effect analysis show that the level of work connectivity behavior among operating room nurses

has a positive predictive effect on work-family conflict, and psychological detachment plays a mediating role between the work connectivity behavior and work-family conflict of operating room nurses. This suggests that work connectivity behavior can directly affect work-family conflict and can indirectly affect work-family conflict through the mediating effect of psychological detachment. A substantial amount of the hospital's business learning and training occupies the rest time of operating room nurses, making it difficult for them to achieve adequate physical and mental relaxation after high-intensity work, exacerbating their anxiety, burnout, and other adverse job emotions [19].

Work connectivity behavior emphasizes that while individuals participate in work in various online forms during non-working hours, they are also undertaking multiple roles in life [16]. Human energy is finite. When nurses continue to work after hours using their phones or WeChat, they also take up time that should be dedicated to family responsibilities, such as educating their children or handling household chores. When they return to the operating room for work, they are not in a fully recovered state, thus requiring more effort to cope with the fast-paced, high-responsibility job demands. This further depletes their energy, making the staff feel even more exhausted, potentially creating a vicious cycle. If they leave the workplace after work, on weekends, or during holidays, and do not engage in work-related activities, allowing operating room nurses to rest fully and allocate appropriate mental and physical resources to family life, work will no longer affect the individual during rest times.

The reaction to workload will gradually decrease and disappear, maintaining a positive balance between work and family. Nurses with a good level of psychological detachment not only physically leave the work environment but also mentally disconnect from work. This psychological "disconnection" allows nurses to completely free themselves from work-related thoughts [20]. The less work connectivity behavior an individual has, the less they invest in work scenarios during their rest time, enabling them to fully detach from work. This allows for the effective release of emotional and mental energy, thereby effectively improving work engagement and positively enhancing the quality of life [21], and improving work-family conflict.

This suggests that nursing managers should place greater emphasis on arranging work reasonably, minimizing work connectivity behavior during non-working hours, and also strengthening dynamic assessment and training of the psychological detachment level of operating room nurses, and arranging work individually. At the same time, for nurses personally, they can try to actively participate in leisure activities outside of work, including sports, Pilates, etc., to proactively enhance their level of psychological detachment, separate work and family roles, balance the relationship between work and family, and seek longer-term benefits.

Conclusion and Shortcomings

The work connectivity behavior of operating room nurses can positively predict their work-family conflict and negatively predict their level of psychological detachment; the level of psychological detachment among operating room nurses can negatively predict their work-family conflict, and psychological detachment plays a partial mediating role between work connectivity behavior and work-family conflict. The work-family conflict of operating room nurses is directly related to the stability of the nursing team and affects the harmonious development of relationships between nursing staff and the hospital, family, and patients. Nursing managers should plan work scientifically, allocate resources reasonably, and pay attention to the investigation and targeted training of the psychological detachment level of operating room nurses.

This study focuses on operating room nurses from a tier-A hospital in Guangzhou, which is relatively regional in scope. Future research should incorporate larger samples and multiple regions to further substantiate the findings and conclusions.

Declaration of Conflict of Interest

I hereby declare that in the process of being involved in [specific matter or decision-making], after careful examination and self-assessment, I confirm that there is no conflict of interest that may affect the impartiality of decision-making. I/Organization promise to maintain an objective and impartial attitude and to comply with all relevant laws, regulations and ethical guidelines when involved in the matter or decision.

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