



INSTITUTO
UNIVERSITÁRIO
DE LISBOA

**Does nurses' job-demands in fighting COVID-19 Pandemic lead to higher levels of
burnout? Evidence from China**

Xiaohui Wang

Master in Management

Supervisor:

PhD Shaozhuang Ma, Associate Professor,

ISCTE - IUL

May 2022

**Does nurses' job-demands in fighting COVID-19 Pandemic lead to higher levels of
burnout? Evidence from China**

Xiaohui Wang

Master in Management

Supervisor:

PhD Shaozhuang Ma, Associate Professor,
ISCTE - IUL

May 2022

Acknowledgement

Upon finishing my master's dissertation, I would like to express my sincere thanks to all those who have offered me help in this process.

I would like to express my deepest appreciation to my supervisor, Professor Shaozhuang Ma, for his continuous and invaluable guidance and support. He always responds quickly to each of my email and answers my questions patiently and generously. Under his guidance, I have a deeper understanding of the academic dissertation and the topic I written.

Thanks also to my family and friends for them support and encouragement during this process.

Resumo

Os enfermeiros constituem um papel valioso no combate à Covid-19. A presente investigação segue as orientações do modelo das exigências laborais e a análise da regressão linear múltipla, a qual foi utilizada na investigação de informação de 336 enfermeiros de Guangdong, na China, tendo sido seleccionados 147 enfermeiros com baixa participação na Covid-19 e 189 com elevada participação.

Os enfermeiros com uma maior participação no tratamento da Covid-19 relataram níveis elevados da carga horária, melhoria da relação com os colegas e com o supervisor, inteligência emocional e work engagement. A carga horária, as exigências emocionais e o conflito trabalho-família influenciam significativamente no burnout dos enfermeiros, relacionando-se, com menor expressão, a relação com os colegas e com o supervisor, o salário e a sua independência no trabalho. A inteligência emocional interfere substancialmente na relação entre a carga de trabalho e o burnout e na relação entre o burnout e a exigência emocional, em contexto da Covid-19.

As análises de regressão do grupo com baixa participação na Covid-19 e do grupo com elevada participação revelaram (considerando o coeficiente de regressão): (1) a carga horária não está fortemente associada ao burnout em enfermeiros com maior participação na Covid-19; (2) as exigências emocionais interferem consideravelmente no burnout em enfermeiros com maior participação na Covid-19; (3) o conflito trabalho-família está estreitamente associado ao burnout em enfermeiros com elevada participação na Covid-19.

Palavras-Chave: Modelo das exigências laborais, burnout, work engagement, Covid-19, enfermeiros, China

Sistema de Classificação JEL: M54 (Gestão Laboral)

摘要

护士是抗击新冠疫情工作中的重要力量, 本文以工作要求-资源视角探讨新冠相关工作对护士工作要求的改变, 以及在新冠疫情大背景下护士工作倦怠与工作投入的相关因素。2022年2月至3月采取线上发放调查问卷的方式, 获得了广东省336名护士的有效问卷, 其中147名护士参与新冠抗疫工作的频率较低, 另外189名护士较频繁的参加了新冠抗疫工作。

结果显示, 较频繁参与新冠抗疫工作的护士的工作量、与同事和上级的关系、情绪智力以及工作投入程度都高于较低频率参加抗疫工作的护士。护士的工作倦怠与工作量、情绪要求以及工作家庭冲突正相关; 与上级关系、收入和工作自主性呈负相关。护士的工作投入与同事关系、上级关系、收入、工作自主性以及情绪智力呈正相关。此外情绪智力在工作量与工作倦怠、情绪要求与工作倦怠的关系中的调节作用也得到了证实。

此外, 对较高频率和较低频率参加新冠抗疫的护士的工作倦怠回归分析表明: 与低频率组相比, 高频组的工作量系数没有明显增加, 但高频组的情绪需求系数和工作家庭冲突系数明显高于低频率组。

关键词: 工作要求-资源模型; 工作倦怠; 工作投入; 新型冠状病毒肺炎; 护士; 中国

JEL 分类号: M54

Abstract

Nurses are an important force in fighting against the COVID-19. Guided by the Job Demands-Resources model, the multiple linear regression analysis was used to analyze data from 336 nurses in Guangdong, China. Among them, 147 nurses participated in the COVID-19 related work less frequently, and the rest 189 participated more frequently.

The nurses who more frequently involved in COVID-19 work reported higher levels of workload, relationships with colleagues and supervisor, and emotional intelligence, and they were more engaged in their work. Nurses' burnout is positively associated with workload, emotional demands, and work-family conflict. And the burnout also negatively associated with relationship with supervisor, remuneration, and independence of work. In addition, nurses' engagement is positively associated with their relationship with supervisor and colleagues, remuneration, independence of work, and emotional intelligence. Emotional intelligence moderates the positive relationship between workload and burnout, and the positive relationship between emotional demands for COVID-19 and burnout.

Regression analyses of subgroups with low frequency COVID-19 work and high frequency COVID-19 work revealed (judging from regression coefficient): 1) workload is not more positively related to job burnout among nurses more frequently involved in COVID-19 work; 2) emotional demands for COVID-19 is more positively related to job burnout among nurses more frequently involved in COVID-19 work; 3) work-family conflict is more positively related to job burnout among nurses more frequently involved in COVID-19 work.

Key Words: Job Demands-Resources model, job burnout, work engagement, COVID-19, nurses, China

JEL Classifications: Labor Management (M54)

General Index

1. Introduction.....	1
2. Literature Review.....	5
2.1 Job Demands-Resources Model.....	5
2.1.1 JD-R Model.....	5
2.1.2 Nurse Job Demands.....	6
2.1.2.1 Nurse Job Demands.....	6
2.1.2.2 How COVID-19 Change Nurse Job Demands.....	6
2.1.3 Nurses Job Resources.....	7
2.2 Job Demands, Job Resources and Job Burnout.....	7
2.2.1 Job Burnout.....	8
2.2.2 Nurses Job Burnout.....	8
2.3 Job resources and Work Engagement.....	10
2.3.1 Work Engagement.....	10
2.3.2 Nurses Work Engagement.....	10
2.4 Moderating Effect of Personal Resources between Job demands and Burnout.....	11
3. Methodology.....	14
3.1 Procedure and Sample.....	14
3.2 Measurement Scale.....	14
3.2.1 Job Demands.....	14
3.2.2 Job Resources.....	15
3.2.3 Emotional Intelligence.....	17
3.2.4 Job Burnout.....	18
3.2.5 Work Engagement.....	18
3.2.6 Demographic Characteristics and Working Characteristics.....	19
3.3 Data Analysis.....	19
4. Findings.....	20
4.1 Sample Description.....	20

4.2 Variance Analysis.....	21
4.2.1 T-Test Results on Frequency of COVID-19 Related Work.....	21
4.2.2 Comparison of Demographic Groups for Job Burnout and Work Engagement.....	22
4.3 Correlation Analysis.....	23
4.4 Regression Analysis.....	26
4.4.1 Regression for Job Burnout.....	26
4.4.2 Regression for Work Engagement.....	28
4.4.3 Comparing Groups Regression for Job Burnout by Job Demands.....	30
5. Discussion and Conclusion.....	33
5.1 Discussion.....	33
5.1.1 Descriptive.....	33
5.1.2 Variance Discussion.....	33
5.1.3 Hypothesis Testing.....	34
5.2 Implications and Contribution.....	36
5.2.1 Implications for Practice.....	36
5.2.2 Theoretical Contribution.....	37
5.3 Limitation and Future Study.....	38
5.4 Conclusion.....	38
Reference.....	39
Appendixes.....	51
<i>Appendixes A-1</i>	51
<i>Appendixes A-2</i>	53
<i>Appendixes A-3</i>	54
<i>Appendixes A-4</i>	55
<i>Appendixes A-4</i>	56

List of Tables

Table 3.1 Rotated Component Matrixa of Job demands.....	15
Table 3.2 Rotated Component Matrixa of Job resources.....	16
Table 3.3 Rotated Component Matrixa of Emotional Intelligence	17
Table 3.4 Rotated Component Matrixa for work engagement.....	19
Table 4.1 Sample Profile (n=336).....	20
Table 4.2 Group Comparisons for Frequency of Involvement in COVID-19 Work	22
Table 4.3 Means, Standard Deviations, Internal Consistencies (Cronbach's α on the Diagonal), and Spearman Correlations Among the Variables (N=336).....	25
Table 4.4 Result of Multiple Linear Regression of Burnout with Job Demands (N=336).....	27
Table 4.5 Result of Multiple Linear Regression of Burnout with Job Resources (N=336).....	28
Table 4.6 Result of Multiple Linear Regression of Engagement with Resources (N=336).....	29
Table 4.7 Result of Multiple Linear Regression of Burnout by Job Demands among low frequency group (N=147).....	31
Table 4.8 Result of Multiple Linear Regression of Burnout by Job Demands among high frequency group (N=189).....	32

List of Figures

Figure 1. Research Model	13
Figure 2. Result of Multiple Linear Regression.....	30

Glossary of acronyms

COVID-19	Novel Coronavirus Disease
WHO	World Health Organization
JD-R model	Job Demands-Resources Model
MBI	Maslach Burnout Inventory
OLBI	Oldenburg Burnout Inventory
COR	Conservation of Resources
QEAWS	questionnaire on the experience and assessment of work scale
WLEIS	Wong and Law Emotional Intelligence Scale
UWES	Utrecht Work Engagement Scale

1. Introduction

Novel coronavirus disease (COVID-19) is a new respiratory pathogen that is spreading rapidly (WHO, 2022a). The signs and symptoms of this disease include mild respiratory symptoms and fever transmitted by droplets and fomites during close unprotected contact with an average incubation period of 5-6 days (Jin et al., 2020; WHO, 2022a). On January 30, 2020, the Emergency Committee convened by the Director-General of the World Health Organization (WHO) concluded that the outbreak met the criteria for an international public health emergency (WHO, 2022b). As reported by the WHO, total cumulative infection cases worldwide was close to 500 million, and total cumulative death exceeded 6.2 million across the world (WHO, 2022c). This disease poses a major challenge to the health care system, as transmission is difficult to prevent, and medical needs are rapidly increasing. Wheeler's (1997) study shows that nurses are more sensitive to job-related stresses in the workplace. A research conducted in November 2021 showed that 32% registered nurses have intention to leave their current direct-patient-care role after the outbreak of COVID-19 in the United States (Gretchen et al., 2021). And another research concluded that the rate of moderate and severe burnout among Chinese health care workers was higher than that during the non-epidemic period (Liu et al., 2020).

Nurses are considered as a risk occupation for job burnout due to unique job characteristics, such as high risk of exposure to pain and death, workplace bullying, lack of peer support, etc. (Wang et al., 2015). Job burnout is negatively related to job performance and individual health (Lubbadeh, 2020). In addition, burnout in nursing can lead to lower quality of medical care, more medical errors, and higher levels of work-related infections (Dyrbye et al. 2019). However, engaged individuals experienced better health conditions and performed better at work (Garcia-Sierra et al., 2016; Jenaro et al., 2011). The evidence shows that work engagement among nurses is positively related to the quality of healthcare and job satisfaction (Garcia-Sierra et al., 2016).

Job burnout is a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment in individuals working in human services professionals (Lubbadeh, 2020). Emotional exhaustion refers to being overextended and exhausted in terms of their emotions, which dimension is most related to job burnout. Depersonalization is a state of response to the residents negatively and cynically. Reduced personal accomplishment refers to the less competent in working with residents or in dealing with their job. Work engagement is the opposite of job burnout (Maslach&Leiter,1997) that refers to vigor, dedication, and absorption (Schaufeli et al.,2002). Vigor in the workplace refers to physical and mental stamina. Dedication refers to a deep commitment to one's work as well as a sense of challenge and significance. Absorption is the act of concentrating on one's work and feeling happy while doing so.

The job demands-resources model (JD-R) has been used in a number of studies to examine how job demands and job resources influence job burnout and engagement (Demerouti et al., 2001; Bakker& Demerouti, 2007; Bakker& Demerouti, 2014; Bakker et al., 2014; Miawati et al., 2021; Schaufeli& Taris, 2014). Job demands refer to the physical, social, or organizational aspects of sustained physical or mental efforts and costs in the working environment, such as physical workload, time pressure, recipient contact and shift work. Job resources refer to the physical, social, or organizational aspects of work that (1) are useful in achieving work goals; (2) offset physiological and psychological costs associated with job demands; (3) promote personal development and growth, such as feedback, rewards, job control, job security, and supervisor support. According to the conservation of resources theory (COR; Hobfoll, 1989), the unbalance of resources gain and loss lead to job burnout.

The job demands related to COVID-19 outbreak among nurses include: (1) workload increase (Yang et al., 2021), which is identified as one of the major job demands associated with burnout (Maslach et al.,2001). (2) high work intensity and more night shifts, which factors are positively related to job burnout in health care workers during COVID-19 (Liu et al.,2020). (3) long-time-wearing of personal protective equipment (Hu et al., 2020), which increases the physical exhaustion and mental stresses of nurses (Al-Rabiaah A et al.,2020). (4) high risk of

infection due to working exposure (Falco et al. 2021; Shu-Ching et al., 2020; Zhu et al., 2021), and worry about family members infection due to their work exposure or isolation from family for safety reasons (Lasalvia et al., 2021; Liu et al., 2020; Fernandez et al., 2020; Zhu et al., 2021). However, the relationship between these factors and job burnout was not mentioned. (5) pandemic-related emotional demands such as feelings of uncertainty, anxiety, depression, and fear (Hu et al., 2020), the influence of which on job burnout is also not clear. The influence of these COVID-19 related job demands on nursing burnout needs further research. (6) the shortage of experienced staff and medical resources supplies like face masks, and personal protective equipment (Shu-Ching et al., 2020; Xie et al., 2020; Yang et al., 2021).

Research on nurses' burnout and its causes under the pandemic era is important, while the nurses' burnout and engagement status with the COVID-19 related work, and the changes of associated factors with nurses' burnout and engagement with the COVID-19 related work is not clear. Therefore, the aim and purpose of this study is as follows:

- To understand job demands changes among nurses with COVID-19 related work
- To understand the burnout status and work engagement status among nurses with COVID-19 related work
- To explore the associations from job demands with burnout among nurses in the context of COVID-19 pandemic
- To explore the associations from job resources and personal resource with work engagement among nurses in the context of COVID-19 pandemic
- To identify and understand the role of personal resource in the relationship between job demands and burnout

The research is organized as follows: The second part will present the relevant concepts, including the JD-R model, job burnout, work engagement, and personal resources. In addition, the hypotheses of this dissertation will be presented based on the literature review. The third part contains the description of the selected model, the selection of the questionnaire samples,

the setting of the questions, and the research method. After analyzing the results, the last part is arranged as follows: first the results are discussed, then the implications of the survey results on theory and practice are presented, and finally the limitations and conclusion are addressed.

2. Literature Review

Based on the main topic of this dissertation, the literature review will contain the topic of the JD-R model, job burnout, work engagement, and personal resources. First, a brief introduction of the JD-R model, nurses' job demands before and after the COVID-19 outbreak, and nurses' job resources is presented. In the second part, the link between the JD-R model and job burnout, the concept of job burnout, and nurses' burnout is presented. In the third part, the JD-R model on work engagement, the brief explanation of work engagement and nurses' engagement is included. Finally, the role of personal resources in the JD-R model, and a specific personal resource, emotional intelligence, is explained.

2.1 Job Demands-Resources Model

2.1.1 JD-R Model

The JD-R model (Demerouti et al., 2001) has two dimensions: job demands and job resources. Job demands refer to the physical or mental efforts that individuals make at work, including any emotional, physical, social or organizational demands, such as workload, time pressure, recipient contact, and role conflict (Demerouti et al., 2001; Maslach et al., 2001). Job resources refer to the physical, mental, social or organizational aspects of work that may be associated with one of the following: (1) useful in achieving their work goals; (2) counteract job demands and associated costs; (3) promote individual development, such as performance feedback, rewards, job control, participation, job security and supervisor support (Demerouti et al., 2001).

The influence of job demands and job resources has been concluded as a dual process (Bakker & Demerouti, 2007). Chronic job demands exhaust individuals' mental and physical resources and energy at work and can lead to health problems, namely the process of health impairment. Job resources have a motivational effect and are positively related to work engagement and organizational outcomes, namely the process of motivation impairment.

2.1.2 Nurse Job Demands

2.1.2.1 Nurse Job Demands

Job demands vary according to occupation and it refers to the physical, psychological, social, and organizational efforts that individuals make to achieve their professional goals (Demerouti et al., 2001). Workload is the most frequently examined factor in predicting nurses' burnout (Dall'Ora et al., 2020). It refers to the quantitative amount of tasks in a given time, and inadequate nurse staffing and time pressure are the sub-aspects of work overload (Broetje et al., 2020). The presence of emotional load among nurses such as secondary post-traumatic stress disorder and compassion fatigue is widely recognized (Abendroth & Flannery, 2006; Missouridou, 2017). Abendroth and Flannery (2006) demonstrated that 78% of hospice nurses were at moderate to high risk of compassion fatigue. In addition, Missouridou (2017) mentioned that there is a high proportion of nurses suffering from secondary post-traumatic stress disorder. The moderate and high physical demands of nurses like neck ache, shoulder ache, and back musculoskeletal disorders were confirmed by Trinkoff et al. (2003). Work-family conflict has been studied as work demands in nursing that can lead to burnout (Camerino et al., 2010; Gorgens & Brand, 2012; Moloney et al., 2018; Yildirim & Aycan, 2008). It refers to the role conflict where role pressure at work can influence role commitment in the family (Geurts et al., 2005).

2.1.2.2 How COVID-19 Change Nurse Job Demands

The COVID-19 outbreak brought several changes in the job demands for nurses. The lack of certain knowledge about early recognition and treatment of infected patients (Shu-Ching et al., 2020; Xie et al., 2020), and medical resources like critical care beds, personal protective equipment, and supplemental oxygen etc. (Shu-Ching et al., 2020; Xie et al., 2020; Yang et al., 2021). And the amount of tasks in giving time is increased, which has been mentioned as work overload, higher work intensity, and staffing shortage (Liu et al., 2020; Yang et al., 2021).

The emotional demands among nurses have been reviewed as follows: (1) Emotional loads like depression, anxiety, and fear exist among nurses (Hu et al., 2020). Hu et al. (2020)

interviewed front-line nurses working in Wuhan, China, and concluded that 14.3%, 10.7%, and 91.2% nurses reported moderate and high levels of anxiety, depression, and fear, respectively. (2) Concern about high infection risk due to work exposure and related emotional demands like fear of infection (Falco et al., 2021; Fernandez et al., 2020; Lasalvia et al., 2021; Liu et al., 2020; Shu-Ching et al., 2020; Zhu et al., 2021). Zhu et al. (2021) found that 79.74% of interviewers feared infection due to work exposure in China. Another study conducted in Italy showed that 82.8% of health care workers were worried about being infected (Lasalvia et al., 2021).

The work-family conflict is a primary job-demands for health care workers (Cotel et al., 2021). The concern and fear of infection of family members due to their work exposure has been mentioned (Fernandez et al., 2020; Lasalvia et al., 2021; Liu et al., 2020; Zhu et al., 2021). Zhu et al. (2021) mentioned that 91.53% of interviewers feared infection among family members via them. Some nurses isolated from family for safety reasons (Liu et al., 2020). The feeling of guilt widely exists when they cannot spend time with their family (Sahay & Wei, 2021).

2.1.3 Nurses Job Resources

Job resources refer to the aspects that can be useful in achieving their job goals, offsetting job demands, and encouraging individuals' development (Demerouti et al., 2001). Nurses' job resources mentioned in the literature are as following: (1) social support, including support from supervisors and from co-workers (Bhatti et al., 2018; Seo et al., 2004; Viotti et al., 2015); (2) remuneration (McVicar 2016; Seo et al., 2004); (3) decision latitude, including aspects related to autonomy, control, and independence (Bhatti et al., 2018; Hu et al., 2017; McVicar, 2016; Seo et al., 2004; Viotti et al., 2015).

2.2 Job Demands, Job Resources and Job Burnout

Previous studies have linked the JD-R model with job burnout, trying to understand the relationship among job demands, job resources and burnout (Demerouti et al., 2001; Bakker&

Demerouti, 2007; Bakker & Demerouti, 2014; Schaufeli & Bakker, 2004; Schaufeli & Taris, 2014). In the research of Demerouti et al. (2001), they link the JD-R model to the Oldenburg Burnout Inventory (OLBI), and concluded that job demand is positively and mainly related to exhaustion, however the influence of job resource on exhaustion is not significant. In 2003, Bakker et al. tested the JD-R model with another famous burnout inventory, the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981), and proved that job demand is positively related to the exhaustion component of burnout, job resources is mainly related to cynicism and professional efficacy components of job burnout. Schaufeli & Bakker (2004) mentioned that burnout is mainly related to job demand but also related to lack of job resources.

2.2.1 Job Burnout

Freudenberger (1974) firstly used the term burnout to describe the characteristic of emotional exhaustion and loss of motivation among volunteers working intensively in the free clinic movement. Maslach and Jackson (1984) defined job burnout as the syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment among individuals working in human services and health care fields. Emotional exhaustion is the feeling of overextended emotional depletion. Depersonalization is the cold reaction towards their residents. Reduced personal accomplishment is a sense of inadequacy and inefficiency. The empirical analysis for job burnout was started from human services and health care occupations, then expanded to all occupations.

2.2.2 Nurses Job Burnout

Job burnout among nurses is associated with personal factors like age, education level, and personal trait (Liu et al., 2020; Xie et al., 2011), and job-related factors, like inadequate resources, job demands, and mental efforts (Al-Rabiaah et al. 2020; Lubbadah, 2020; Wang et al., 2015). The moderate and high level of nurse's burnout has been proved in the Philippines (Rosales et al., 2013), Iran (Rezaei et al. 2018), and Thailand (Nantsupawat et al., 2016). The moderate and high levels of burnout also existed among Chinese nurses (Wang et al., 2015, Xie et al., 2011). In addition, a study of front-line nurses' burnout during COVID-19 in

Wuhan, China, published in 2020, found that half of nurse-respondents reported moderate and high level of burnout (Hu et al., 2020). Nurses' job burnout can damage their mental health (Talaee et al., 2020), and is associated with job satisfaction (Rosales et al., 2013). Nurses suffering from burnout may change their job (Wang et al., 2015). The quality of nursing work is another negative consequence of job burnout (Nantsupawat et al., 2016; Wang et al., 2015). Nurse burnout increased the odds of poor patient outcomes including low quality of care, even medication errors (Talaee et al., 2020).

Based on the review of previous researches, nurses' burnout is associated with the two dimensions of JD-R model, namely job demands and job resources (Demerouti et al., 2001; Maslach & Jackson, 1981; Schaufeli & Bakker, 2004). In addition, the study showed that emotional exhaustion is more strongly related to job demands than other two dimensions (Lee & Ashforth, 1996). So, in this dissertation, we only tested emotional exhaustion to represent job burnout. Thus, the hypothesis is stated:

H1.1. Nurses' workload is positively related to their burnout.

H1.2. Nurses' emotional demands for COVID-19 is positively related to their burnout.

H1.3. Nurses' work-family conflict is positively related to their burnout.

H2.1. Workload is more positively related to job burnout among nurses more frequently involved in COVID-19 work.

H2.2. Emotional demands for COVID-19 is more positively related to job burnout among nurses more frequently involved in COVID-19 work.

H2.3. Work-family conflict is more positively related to job burnout among nurses more frequently involved in COVID-19 work.

H3.1. Nurses' relationship with colleagues is negatively related to their burnout.

H3.2. Nurses' relationship with supervisor is negatively related to their burnout.

H3.3. Nurses' remuneration is negatively related to their burnout.

H3.4. Nurses' independence of work is negatively related to their burnout.

2.3 Job resources and Work Engagement

The JD-R model has been used in the research of associated job characteristics of work engagement (Bakker et al., 2014; Demerouti et al., 2001). Demerouti et al. (2001) found that job resource is positively related to work engagement. And this relationship has also been proved by other research (Crawford et al., 2010).

2.3.1 Work Engagement

Individuals who work in engagement have a sense of energetic and effective connection with their job (Bakker et al., 2014). According to Maslach and Leiter (1997), engagement is the opposite of burnout, with three dimensions, namely energy, involvement, and efficacy. Schaufeli et al. (2002) defined work engagement as a positive mind characterized by vigor, dedication, and absorption. Vigor refers to energetic and mental resilience at work. Dedication refers to being strongly involved in the work and feeling challenged and meaningful. Absorption refers to concentrating on work and feeling happy when focusing on working.

2.3.2 Nurses Work Engagement

Zhang et al. (2021) concluded that work engagement among nurses after the COVID-19 outbreak was at a moderate level in China, and the engagement level was higher than during non-epidemic period. The antecedents of work engagement is one of the major themes of nurses' work engagement (Garcia-Sierra et al., 2016). Mason et al. (2014) mentioned two types of work engagement sources are job resources, and employee's personal resources. Social support is positively related to work engagement (Kim et al., 2020). Garcia-Sierra et al. (2016) mentioned social support, reward, and control etc. are organizational antecedents of nurses' work engagement. Personal antecedents included personal traits, professional characteristics, family issues, and work orientation (Garcia-Sierra et al., 2016). Zhang et al. (2021) mentioned that married nurses were more engaged than single nurses, especially young nurses. Kim et al. (2020) found that nurses aged 40 or over, female, married, and have work experience in caring COVID-19 patients have higher levels of work engagement. Ravichandran et al. (2011) proved the relationship between emotional intelligence and work engagement, however they argued that emotional intelligence cannot influence work

engagement alone.

Based on the review above, the hypothesis is stated as following:

H4.1. Nurses' relationship with colleagues is positively related to their work engagement.

H4.2. Nurses' relationship with supervisor is positively related to their work engagement.

H4.3. Nurses' remuneration is positively related to their work engagement.

H4.4. Nurses' independence of work is positively related to their work engagement.

H4.5. Emotional intelligence as personal resources is positively related to nurses' work engagement.

2.4 Moderating Effect of Personal Resources between Job Demands and Burnout

In the early research of the JD-R model, the researchers focus more on job resources, but later on, the moderating effect of personal factors in the JD-R model has been recognized (Bakker & Demerouti, 2007). Personal resources refer to individual's self-evaluations that enable them to successfully control and affect their environment (Hobfoll et al., 2003). It has a moderating effect on the relationship between job demands and exhaustion (Garrosa et al., 2011). However, Xanthopoulou et al. (2007) argued that personal resources have no offsetting effect on exhaustion. Huang et al. (2016) argued the role of personal resources, like self-esteem and optimism, as mediator.

Emotional intelligence refers to the ability to recognize emotions and absorb, understand, and manage them (Mayer et al., 1999). They emphasize abilities of identification, understanding, usage, and self-regulation (Salovey et al., 2000). It has also been argued as a mixed ability for adaptive personal functioning and coping with environmental demands, including multiple aspects like motivation, personal traits, temperament, character, and social skills (Zeidner et al., 2004). Bar-On (1997) defined emotional intelligence as a range of non-cognitive capabilities, competencies, and skills that affect the ability to cope with environmental demands and pressures.

According to the COR theory, humans are motivated to protect their resources and gain new resources (Hobfoll, 1989). Emotional intelligence affects the perception of resource loss (Liao & Yan, 2014). Individuals have different levels of ability to manage their emotions and use these emotions to achieve goals (Wong & Law, 2002). The partly moderating effect of emotional intelligence on relationships between job demands and burnout has been confirmed (Chen, S & Chen, C, 2018). Emotional intelligence is significantly related to burnout in the study of South African nurses (Gorgens & Brand, 2012), and this relationship has also been proved by a study about doctors (Weng et al., 2011). Zhu et al., (2015) confirmed that emotional intelligence has an influence on work engagement indirectly.

Based on the literature reviews, the role of emotional intelligence between job demands and burnout is not clear, and we suppose to test this hypothesis:

H5. Emotional intelligence moderates the relationship between job demands and job burnout, in such a way, the relationship between job demands and job burnout is weaker for those nurses with higher emotional intelligence than those with lower one.

According to the review of relevant literature and the hypothesis proposed, the research model of this dissertation is summarized as figure 1.

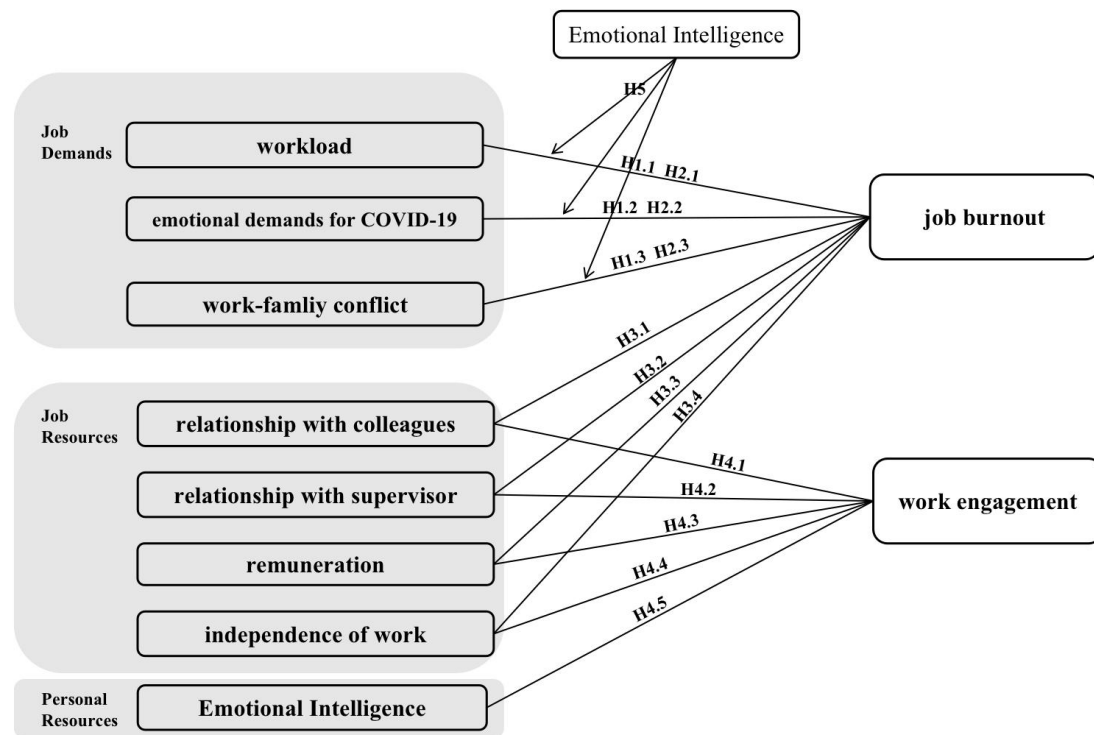


Figure 1. Research Model

3. Methodology

3.1 Procedure and Sample

The research was conducted by a descriptive survey using an online questionnaire from February to March 2022, focusing on registered nurses working in hospitals in Guangdong Province, China. The questionnaires were accompanied by an online survey platform called “Wenjuanxing”. The goal of the investigation was briefly introduced in the questionnaire, and the confidentiality and anonymity of their answers was ensured. For those who volunteered to answer, a QR code or link to the questionnaire was given by Chinese messaging app WeChat. Of the 366 registered nurses who completed the questionnaire, 30 (8.2%) questionnaires were excluded for answering all the items with the same answer. The analysis in this research was based on the 336 (91.8%) valid questionnaires.

3.2 Measurement Scale

The variables measured by the questionnaire could contain the following six aspects: (1) job demands; (2) job resources; (3) emotional intelligence; (4) job burnout; (5) work engagement; (6) demographic characteristics.

3.2.1 Job Demands

This study examined three job demands, namely workload, emotional demands for COVID-19, and work-family conflict. The workload was measured with three-item (e.g., “I have too much work to do”), which were from questionnaires on the experience and assessment of work scale (QEAWS; Lequeurre et al., 2013). It was rated on a 6-point scale, ranging from 1= never to 6= every day. The emotional demands for COVID-19 were measured with 3-item (Yıldırım et al., 2020), and an example of item is “Worry about oneself contracting COVID-19”. Work-family conflict was measured with the 5-item scales from Netemeyer et al. (1996), and the example of item is “The demands of my work interfere with my home and family life.” The emotional demands for COVID-19 and work-family conflict were rated on a 6-point scale from 1=strongly disagree to 6=strongly agree. The Chinese version of all items were translated from the English version.

The KMO of job demands was .86, and the Bartlett's Bartlett test's $p < .001$, suggesting factor analysis and PCA was adequate for job demands. Table 3.1 summarized the component of job demands. The component 3 included JD1, JD2, and JD3 were mainly mentioned about the workload. The component 2 included JD4, JD5, JD6 were mainly about the emotional demands for COVID-19. The component 1 contained five-item (JD7-JD11) of work-family conflict. The division of job demands' components was consistent with the previous suggestions. The Cronbach's α of job demand was .88 with good internal consistency. The Cronbach's α of workload, the emotional demands for COVID-19, and work-family conflict were .85, .88, and .94 respectively.

Table 3.1 Rotated Component Matrixa of Job demands

item	Component		
	1	2	3
JD1 I have too much work to do			.89
JD2 I have to work extra hard in order to complete something			.84
JD3 I have to hurry			.87
JD4 Worry about oneself contracting COVID-19		.88	
JD5 Worry about a family member contracting COVID-19 because of me/my work		.88	
JD6 Worry about COVID-19 occurring in the region		.83	
JD7 The demands of my work interfere with my home and family life.	.80		
JD8 The amount of time my job takes up makes it difficult to fulfill family responsibilities.	.91		
JD9 Things I want to do at home do not get done because of the demands my job puts on me.	.89		
JD10 My job produces strain that makes it difficult to fulfill family duties.	.91		
JD11 Due to work-related duties, I have to make changes to my plans for family activities.	.80		

3.2.2 Job Resources

This study examined four job resources, namely relationship with colleagues, relationship with superior, remuneration, and independence in the work. All items were assessed with the questionnaire on the experience and assessment of work (QEAW; Lequeurre et al.,2013). Relationship with colleagues was measured with four items (e.g., "In my work, I feel appreciated by my colleagues."). Relationship with superior was measured with 4 items (e.g., "In my work, I feel appreciated by my superior."). Remuneration was measured with four

items (e.g., “I think my organization pays good salaries.”). Independence in the work was measured with four items (e.g., “I have an influence on the pace of work.”). All items were rated on a 6-point scale from 1=strongly disagree to 6=strongly agree. The Chinese version of all statements were translated based on the English version.

The KMO for job resources was .90, and the value of Bartlett’s $p < .001$, suggesting that the factor analysis and PCA was adequate for job demands. Table 3.2 summarized the component of job resources. The component 3 included four items about relationship with colleagues (JR1-JR4), and the component 2 contained four items about relationship with supervisor (JR5-JR8). The component 1 contained four items (JR9-JR12), and it was named as remuneration. Finally, the component 4 included four items about independence of work (JR13-JR16). The division of job demands’ components was consistent with the previous suggestions, and the construct validity of job resources has been verified. The Cronbach’s α of job resources was .92, and the Cronbach’s α of relationship with colleagues, relationship with supervisor, remuneration, and independence of work were .85, .94, .93, and .86 respectively.

Table 3.2 Rotated Component Matrixa of Job resources

	item	Component			
		1	2	3	4
JR1	In my work, I feel appreciated by my colleagues.			.74	
JR2	I get on well with my colleagues.			.85	
JR3	I can count on my colleagues when I encounter difficulties in the work.			.70	
JR4	There a good atmosphere between me and my colleagues.			.82	
JR5	In the work, I feel appreciated by my superior.		.73		
JR6	I can count on my superior when I come across difficulties in the work.		.82		
JR7	I get on well with my superior.		.86		
JR8	There is a good atmosphere between me and my superior.		.86		
JR9	I think my organization pays good salaries.	.89			
JR10	I think I am paid enough for the work that I do.	.90			
JR11	I think I am fairly paid in comparison with other people in my department.	.84			
JR12	I can live comfortably on my pay.	.84			
JR13	I have an influence on the pace of work.				.74
JR14	I can personally decide how much time I need for a specific activity				.83
JR15	I can decide the order in which I carry out your work on my own.				.81
JR16	I can participate in the decision about when something must be completed.				.72

3.2.3 Emotional Intelligence

Emotional intelligence was assessed with the Wong and Law Emotional Intelligence Scale (WLEIS; Wong & Law, 2002). The WLEIS is composed of four sub-constructs: self-emotions appraisal (4-item, e.g. “I have a good sense of why I feel certain feelings most of the time.”), others-emotions appraisal (4-item, e.g., “I always know my friends' emotions from their behaviour.”), use of Emotion (4-item, e.g. “I always get goals for myself and then try my best to achieve them.”), and regulation of Emotions (4-item, e.g. “I am able to control my temper so that I can handle difficulties rationally.”). The Chinese version of all statements were quoted from Chen Quan (2013). All responses were rated on a 6-point Likert scale from 1=strongly disagree to 6=strongly agree.

The KMO for emotional intelligence was .92, and the Bartlett's $p < .001$, which demonstrated that the factor analysis and PCA was adequate for emotional intelligence. Table 3.3 summarized the component of emotional intelligence, including self-emotions appraisal (component 3 including EI1-EI4), others-emotions appraisal (component 2 including EI5-EI8), use of emotion (component 4 including EI9-EI12), and regulation of emotions (component 1 including EI13-EI16), which was similar with the previous suggests. The Cronbach's α of EI was .94, and the Cronbach's α of self-emotions appraisal, others-emotions appraisal, use of emotion, and regulation of emotion were .90, .93, .87, and .94 respectively.

Table 3.3 Rotated Component Matrixa of Emotional Intelligence

	item	Component			
		1	2	3	4
EI1	I have a good sense of why I feel certain feelings most of the time.			.64	
EI2	I have a good understanding of my own emotions.			.84	
EI3	I always understand what I feel.			.89	
EI4	I always know whether I am happy or not.			.79	
EI5	I always know my friends' emotions from their behavior.		.80		
EI6	I am a good observer of others' emotions.		.91		
EI7	I am sensitive to the feelings and emotions of others.		.90		
EI8	I have a good understanding of the emotions of people around me.		.86		
EI9	I always get goals for myself and then try my best to achieve them.				.68
EI10	I always tell myself I am a competent person.				.77
		17			

EI11 I am a self-motivating person.	.73
EI12 I would always encourage myself to try my best.	.60
EI13 I am able to control my temper so that I can handle difficulties rationally.	.81
EI14 I am quite capable of controlling my own emotions.	.83
EI15 I can always calm down quickly when I am very angry.	.87
EI16 I have good control of my emotions.	.87

3.2.4 Job Burnout

In this dissertation, we only tested emotional exhaustion which is the most strongly related dimension of burnout (Lee & Ashforth, 1996). Emotional exhaustion was measured with 5-item from Chinese version of Maslach Burnout Inventory-General Survey translated by Li Chaoping & Shi Kan (2003) (e.g., “I feel emotionally drained from my work.”; “I feel used up at the end of the workday.”). All items were rated on a 6-point Likert scale from 1= never to 6=always. The KMO value for job burnout was .88 with Bartlett’s Bartlett test’s $p < .001$, which demonstrated that factor analysis and PCA was suitable for job burnout. In addition, the 5 items of job burnout only contain one component which has been called emotional exhaustion. The Cronbach’s α of job burnout was .94.

3.2.5 Work Engagement

Work engagement was measured with the 9-item Utrecht Work Engagement Scale (UWES; Schaufeli et al., 2006). UWES contains three sub-scales: vigor (3-item, e.g., “At my work, I feel bursting with energy.”), dedication (3-item, e.g., “I am enthusiastic about my job.”), and absorption (3-item, e.g., “I feel happy when I am working intensely.”). The Chinese version of all statements was quoted from Lu Minghui (2017). All items were rated on a 6-point Likert scale from 1=never to 6=every day.

The KMO value for work engagement was .91, and Bartlett's $p < .000$, which showed that the factor analysis and PCA was adequate for work engagement. Table 3.4 showed the component of work engagement. The component 1 contained four items including V1, V2, D1, and D2. the component 2 included D3, A2, and A3. The component 3 included V3 and A1. Considering the factor structure was different from its original structure, we decided to use

work engagement as an aggregated construct instead of its three dimensions in the analysis. The Cronbach's α of work engagement was .93.

Table 3.4 Rotated Component Matrixa for work engagement

item	Component		
	1	2	3
V1 At my work, I feel bursting with energy.	.82		
V2 At my job, I feel strong and vigorous.	.78		
D1 I am enthusiastic about my job.	.79		
D2 My job inspires me.	.69		
V3 When I get up in the morning, I feel like going to work.			.71
A1 I feel happy when I am working intensely.			.87
D3 I am proud of the work that I do.		.74	
A2 I am immersed in my work.		.78	
A3 I get carried away when I am working.		.85	

3.2.6 Demographic Characteristics and Working Characteristics

Demographic characteristics collected in this research included age, gender, department, employment category, position, marital status, education level. In addition, length of service in this hospital, and work content and frequency of involvement in COVID-19 work has been collected.

3.3 Data Analysis

The data analysis was conducted using IBM SPSS Statistics software (version 26 for Mac). Descriptive statistics was used to analyze the demographic characteristics of the sample, and other variables. Correlation analysis and multiple linear regression analysis were adopted in the research to analyze the relationship between different variables. Independent sample t-test and one-way ANOVA were used for analysis of the difference between variables.

4. Findings

4.1 Sample Description

Questionnaires were mainly collected from four public hospitals (93.4%) located in Guangdong Province, China. According to Table 4.1, most participants were involved in COVID-19 work in the last 3 months (85.2%), and 32.1% involved everyday. The major work content about COVID-19 included nucleic acid testing (62.5%), epidemiological investigation (42.9%). The nurses in the research were mainly working in surgical department (17.9%), internal medicine department (16.4%), emergency department (14.9%), and obstetrics and gynecology department (10.1%). Nurses' mean age was 32.2 years and 96.4% were female, junior nurses (65.4%), and had worked in the present hospital above 8-year (46.7%). The most participants had a college degree or below (51.5%), and 47.3% had a bachelor degree. The mean of job burnout was 3.73 (SD = 1.17), and the mean of work engagement was 4.17 (SD = 1.11).

Table 4.1 Sample Profile (n=336)

variable	N (%)	variable	N (%)
Gender		Length of service in your hospital (years)	
Male	12 (3.6)	≤1	31 (9.2)
Female	324 (96.4)	1-2	50 (14.9)
Age		3-4	35 (10.4)
18-29	165 (49.1)	5-6	44 (13.1)
30-39	87 (25.9)	7-8	19 (5.7)
40-49	61 (18.2)	≥8	157 (46.7)
≥50	23 (6.8)	Hospital where you work	
Marital Status		Hospital A (number of beds, ≥2000)	42 (12.5)
Married	204 (60.7)	Hospital B (number of beds, 1001-2000)	65 (19.3)
Unmarried	115 (34.2)	Hospital C (number of beds, ≤500)	134 (39.9)
Other	17 (5.1)	Hospital D (number of beds, ≤500)	73 (21.7)
Professional position		Other	22 (6.6)
primary nurses	101 (30.1)	Frequency of involvement in COVID-19 work in the last 3 months	
junior nurses	220 (65.4)	Never	24 (7.1)
senior nuress	15 (4.5)	Rarely	26 (7.7)
Education		Occasionally	97 (28.9)

College degree or below	173 (51.5)	Frequently (Several times a month)	52 (15.5)
Bachelor degree	159 (47.3)	Usually (Several times a week)	29 (8.6)
Master degree or above	4 (1.2)	Everyday	108 (32.1)
Working department		Work content changes from COVID-19	
Surgical department	60 (17.9)	Nucleic acid testing	210 (62.5)
Internal Medicine	55 (16.4)	Epidemiological Investigation	144 (42.9)
Obstetrics and Gynecology department	34 (10.1)	Isolated hotel	17 (5.1)
Pediatrics department	14 (4.2)	pairing assistance	80 (23.8)
Emergency department	50 (14.9)	COVID-19 Vaccination	40 (11.9)
Operating room	17 (5.1)	Other	82 (24.4)
Intensive care unit (ICU)	24 (7.1)		
Other	82 (24.4)		

4.2 Variance Analysis

Independent sample t-tests were performed to assess whether the frequency of nurses' involvement in COVID-19 work affected nurses' working, and whether gender influenced burnout and engagement among nurses. One-way ANOVA was performed to analyze the influence of burnout and engagement from age, material status, professional position, education, department, length of service, and organization.

4.2.1 T-Test Results on Frequency of COVID-19 Related Work

As reported in Table 4.2, nurses never, rarely and occasionally involved in the work for COVID-19, were considered as "low frequency". And nurses took part in COVID-19 related work frequently (several times a month), usually (several times a week), and everyday, were considered as "high frequency". The nurses who more frequently involved in COVID-19 work reported higher workload ($M = 5.26$, $SD = .87$, $p < .001$), higher level of relationships with colleagues ($M = 4.79$, $SD = .77$, $p = .047$) and supervisor ($M = 4.71$, $SD = .89$, $p = .001$). Nurses with high frequency were more engaged in their work ($M = 4.31$, $SD = 1.10$, $p = .008$). In addition, there is a marginal difference ($p < .07$) for emotional intelligence between high frequency group ($M = 4.43$, $SD = .66$) and low frequency group ($M = 4.56$, $SD = .68$).

Table 4.2 Group Comparisons for Frequency of Involvement in COVID-19 Work

	N	M	SD	<i>p</i>
workload				
Low Frequency	147	4.76	1.09	.00**
High Frequency	189	5.26	0.87	
emotional demand for COVID-19				
Low Frequency	147	3.87	1.46	0.67
High Frequency	189	3.80	1.65	
work-family conflict				
Low Frequency	147	3.58	1.3	0.85
High Frequency	189	3.55	1.39	
relationship with colleagues				
Low Frequency	147	4.62	0.76	.047*
High Frequency	189	4.79	0.77	
relationship with supervisor				
Low Frequency	147	4.39	0.89	.001**
High Frequency	189	4.71	0.89	
remuneration				
Low Frequency	147	3.56	1.11	0.28
High Frequency	189	3.69	1.07	
independence of work				
Low Frequency	147	4.11	0.95	0.61
High Frequency	189	4.16	0.97	
emotional intelligence				
Low Frequency	147	4.43	0.66	0.07
High Frequency	189	4.56	0.68	
job burnout				
Low Frequency	147	3.75	1.08	0.7
High Frequency	189	3.70	1.24	
work engagement				
Low Frequency	147	3.98	1.1	.008**
High Frequency	189	4.31	1.1	

Note. **p* < .05. ***p* < .01. Low Frequency= never, rarely, and occasionally; High Frequency=frequently (several times a month), usually (several times a week), and everyday.

4.2.2 Comparison of Demographic Groups for Job Burnout and Work Engagement

The analysis of demographic characteristics was conducted via independent sample t-test and

one-way ANOVE test, and the gender group had been excluded in this research because only 12 (3.6%) male nurses participated in this research. Nurses' burnout scores had significant differences in groups of age ($p = .040$), marital status ($p < .001$), education level ($p = .017$), and the organization they worked for ($p < .001$). Burnout among nurses aged from 18 to 29 ($M = 3.85$, $SD = 1.19$) was significantly higher than nurses aged between 30 and 39 ($M = 3.69$, $SD = 1.08$), between 40 to 49 ($M = 3.65$, $SD = 1.19$), and above 50 ($M = 3.13$, $SD = 1.12$) respectively. Significant differences on the level of burnout were reported among the three marital status groups (married, $M = 3.61$, $SD = 1.13$; unmarried, $M = 4.04$, $SD = 1.18$; other, $M = 2.94$, $SD = .96$). And nurses' burnout with college degree or below ($M = 3.55$, $SD = 1.14$) was significantly lower than those with bachelor degree ($M = 3.92$, $SD = 1.18$).

Nurses work engagement was significant different in groups of age ($p = .021$), material status ($p = .002$), education level ($p = .018$), department they serviced ($p = .047$), and the organization they working for ($p < .001$). Nurses aged from 40 to 49 ($M = 4.49$, $SD = .98$) significantly more engaged than nurses aged between 18 and 29 ($M = 4.01$, $SD = 1.12$). Significant differences on the level of engagement were reported among the three marital status groups (married, $M = 4.24$, $SD = 1.06$; unmarried, $M = 3.94$, $SD = 1.18$; other, $M = 4.88$, $SD = .85$). The level of work engagement among nurses with a college degree or below ($M = 4.33$, $SD = 1.04$) was significantly higher than those with bachelor degree ($M = 4.00$, $SD = 1.17$). In addition, the engagement level among nurses working in ICU ($M = 3.66$, $SD = 1.23$) was significantly higher than nurses working in the operation room ($M = 3.42$, $SD = 1.08$).

4.3 Correlation Analysis

Table 4.3 showed the Spearman correlation coefficients among the variables. The variables significantly related to the frequency of involvement in COVID-19 related work, namely workload ($r = .23$, $p < .001$), relationship with supervisor ($r = .19$, $p < .001$), and work engagement ($r = .18$, $p = .001$).

Nurses' burnout was positively and significantly related to three job demands, including the

workload ($r = .24, p < .001$), the emotional demands for COVID-19 ($r = .14, p = .011$), and work-family conflict ($r = .60, p < .001$). In addition, burnout was significantly and negatively related to three job resources, namely relationship with supervisor ($r = -.15, p = .007$), remuneration ($r = -.24, p < .001$), and independence of work ($r = -.19, p < .001$). Emotional intelligence was negative and significantly related to job burnout ($r = -.16, p = .004$).

Work engagement was significantly and positively related to the relationship with colleagues ($r = .22, p < .001$), relationship with supervisor ($r = .29, p < .001$), remuneration ($r = .24, p < .001$), and independence of work ($r = .32, p < .001$). In addition, the association between emotional intelligence and work engagement is positive ($r = .50, p < .0001$).

Table 4.3 Means, Standard Deviations, Internal Consistencies (Cronbach's α on the Diagonal), and Spearman Correlations Among the Variables (N=336)

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. frequency of involvement in COVID-19 work	/	/																			
2. gender	/	/	-.06																		
3. age	/	/	.17**	.18**																	
4. marital status	/	/	-.02	-.19**	-.41**																
5. position	/	/	.17**	.15**	.64**	-.48**															
6. education	/	/	.06	-.02	-.03	-.19**	.26**														
7. department	/	/	.12*	-.04	.27**	-.02	.14*	-.16**													
8. length of service	/	/	.06	.21**	.76**	-.53**	.70**	.17**	.16**												
9. organization	/	/	-.10	-.06	-.12*	.03	-.05	.19**	-.14**	-.11*											
10. workload	5.05	1.00	.23**	.00	.11*	.02	.02	.02	.00	.03	-.01	(.85)									
11. emotional demands for COVID-19	3.83	1.57	-.02	-.01	.00	.02	-.05	-.07	.00	.03	.02	-.01	(.88)								
12. work-family conflict	3.57	1.35	-.06	-.03	.06	-.15**	.11*	.28**	-.06	.13*	.22**	-.04	.03	(.94)							
13. relationship with colleague	4.71	.77	.08	-.05	.23**	-.12*	.24**	-.02	.13*	.23**	-.01	.12*	-.03	-.02	(.85)						
14. relationship with supervisor	4.57	.90	.19**	-.08	.13*	.00	.11*	.08	.04	.09	-.07	.09	.01	-.14*	.10	(.94)					
15. remuneration	3.64	1.09	.02	.10	.05	.01	.02	-.05	.03	.00	.05	.02	-.12*	-.25**	-.03	-.04	(.93)				
16. independence of work	4.14	.96	.02	.05	.07	-.01	.05	-.16**	-.01	.11*	-.01	.04	.13*	-.20**	.03	.08	.06	(.86)			
17. emotional intelligence	4.50	.68	.10	.07	.19**	-.11*	.15**	-.09	.02	.20**	-.06	.16**	.05	-.16**	.36**	.27**	.09	.57**	(.94)		
18. job burnout	3.73	1.17	-.02	-.13*	-.13*	.08	-.13*	.15**	-.12*	-.09	.25**	.24**	.14*	.60**	-.07	-.15**	-.24**	-.19**	-.16**	(.94)	
19. work engagement	4.17	1.11	.18**	.00	.17**	-.04	.08	-.15**	.11	.12*	-.20**	.19**	.03	-.35**	.22**	.29**	.24**	.32**	.50**	-.39**	(.93)

* $p < .05$. ** $p < .01$.

4.4 Regression Analysis

In this part, multiple linear regression analysis was used to analyze the associated factors of burnout and engagement among nurses respectively. In addition, the moderate effect of emotional intelligence on the relationship between job demands and job burnout has been discussed.

4.4.1 Regression for Job Burnout

A multiple linear regression analysis was conducted to analyze nurses' job burnout based on the three variables of job demands with controlling variables, namely gender, age, marital status, education, organization (Table 4.4). The results of regression indicated that the three variables explained 41.9% of the variance ($p < .001$). Nurses' workload ($\beta = .30, p < .001$), emotional demands for COVID-19 ($\beta = .14, p = .001$), and work-family conflict ($\beta = .60, p < .001$) were positively related to nurses' burnout. These results supported the following hypothesis: "H1.1. Nurses' workload is positively related to their burnout.", "H1.2. Nurses' emotional demands for COVID-19 is more positively related to their burnout.", and "H1.3. Nurses' work-family conflict (WFC) is more positively related to their burnout.".

The moderate effect of emotional intelligence between three variables of job demands and job burnout was tested by cross variables including emotional intelligence * workload, emotional intelligence * emotional demands for COVID-19, and emotional intelligence * work-family conflict. The results of multiple linear regression analysis revealed emotional intelligence * work-family conflict ($p = .85$) not be statistically significant variables in the burnout model, thus there was no moderate effect of emotional intelligence between work-family conflict and job burnout. The emotional intelligence * workload ($\beta = -.08, p = .03$), emotional intelligence * emotional demands for COVID-19 ($\beta = .09, p = .03$) were significantly associated with job burnout. The coefficient for workload, emotional demands for COVID-19, and work-family conflict in the moderating model was .30 ($p < .001$), .12 ($p = .002$), .590 ($p < .001$) respectively. This partly supports the hypothesis 5 "Emotional intelligence moderates the relationship between job demands and job burnout, in such a way, the relationship between job demands and job burnout is weaker for those nurses with higher emotional intelligence

than those with lower one.” The moderate effect of emotional intelligence was depending on the special job demands, in this research, it was approved that the moderating effect of emotional intelligence was between workload and burnout and between emotional demands for COVID-19 and burnout.

Table 4.4 Result of Multiple Linear Regression of Burnout with Job Demands (N=336)

	Model 1 (control variables)				Model 2 (independent variables)				Model 3 (moderator)			
	B	SE B	p	β	B	SE B	p	β	B	SE B	p	β
gender	-0.46	0.29	0.11	-0.09	-0.27	0.22	0.22	-0.05	-0.30	0.22	0.16	-0.06
age	-0.08	0.06	0.15	-0.08	-0.17	0.04	0.00	-0.16**	-0.16	0.04	0.00	-0.16
marital status	0.05	0.10	0.59	0.03	0.12	0.07	0.10	0.07	0.12	0.07	0.08	0.07
education	0.22	0.11	0.03	0.12*	-0.07	0.08	0.41	-0.04	-0.05	0.08	0.53	-0.03
organization	0.12	0.03	0.00	0.19**	0.05	0.03	0.05	0.08	0.05	0.03	0.05	0.08
workload					0.30	0.04	0.00	0.30**	0.30	0.04	0.00	0.30**
emotional demands for COVID-19					0.14	0.04	0.00	0.14**	0.12	0.04	0.00	0.12**
work-family conflict					0.60	0.04	0.00	0.60**	0.59	0.04	0.00	0.59**
EI*workload									-0.08	0.04	0.03	-0.08*
EI*emotional demands for COVID-19									0.08	0.04	0.03	0.09*
EI* work-family conflict									0.01	0.04	0.85	0.01
R ²			0.08				0.50				0.51	
Adjusted R ²			0.07				0.49				0.50	
F value			$F(5, 330) = 5.87, p < .001$				$F(8, 327) = 40.92, p < .001$				$F(11, 324) = 31.09, p < .001$	
ΔR^2			0.08				0.42				0.01	
ΔF value			5.87				91.30				2.93	

Note. Dependent variable: Job burnout. * $p < .05$. ** $p < .01$. EI = emotional intelligence.

The linear regression analysis for job resources and job burnout was conducted (Table 4.5), and the model explained 14.1% of the variance. It is indicated that the nurses' burnout was significantly and negatively related to relationship with supervisor ($\beta = -.20, p < .001$), remuneration ($\beta = -.27, p < .001$), and independence of work ($\beta = -.16, p = .001$). This results supposed the hypothesis 3.2 “Nurses’ relationship with supervisor is negatively related to their burnout.”, hypothesis 3.3 “Nurses’ remuneration is negatively related to their burnout.”, and hypothesis 3.4 “Nurses’ independence of work is negatively related to their

burnout.” However, the result revealed relationship with colleagues not statistically significant in the model ($p = .11$). Thus, the hypothesis 3.1 “Nurses’ relationship with colleagues is negatively related to their burnout.” was not supported by this research.

Table 4.5 Result of Multiple Linear Regression of Burnout with Job Resources (N=336)

	Model 1 (control variables)				Model 2 (independent variables)			
	B	SE B	p	β	B	SE B	p	β
gender	-0.46	0.29	0.11	-0.09	-0.48	0.27	0.08	-0.09
age	-0.08	0.06	0.15	-0.08	-0.02	0.06	0.72	-0.02
marital status	0.05	0.10	0.59	0.03	0.08	0.09	0.36	0.05
education	0.22	0.11	0.03	0.12*	0.17	0.10	0.10	0.09
organization	0.12	0.03	0.00	0.19**	0.12	0.03	0.00	0.19**
relationship with colleagues					-0.08	0.05	0.11	-0.08
relationship with supervisor					-0.20	0.05	0.00	-0.20**
remuneration					-0.27	0.05	0.00	-0.27**
independence of work					-0.16	0.05	0.00	-0.16**
R ²			0.08				0.22	
Adjusted R ²			0.07				0.20	
F value	$F(5, 330) = 5.87, p < .001$				$F(9, 326) = 10.41, p < .001$			
ΔR^2			0.08				0.14	
ΔF value			5.87				14.84	

Note. Dependent variable: Job burnout. * $p < .05$. ** $p < .01$.

4.4.2 Regression for Work Engagement

The relationship between job resources, personal resources and work engagement was tested by multiple linear regression analysis, with controlling gender, age, material status, education level, department, and organization (Table 4.6). The results of regression indicated that the four variables explained 32.8% of the variance ($p < .001$). Nurses’ engagement was significantly and positively related to four variables of job resources, including relationship with colleagues ($\beta = .12, p = .02$), relationship with supervisor ($\beta = .23, p < .001$), remuneration ($\beta = .25, p < .001$), and independence of work ($\beta = .15, p = .01$). This supported hypothesis 4.1 “Nurses’ relationship with colleagues is positively related to their work engagement.”, hypothesis 4.2. “Nurses’ relationship with supervisor is positively related to their work engagement.”, hypothesis 4.3. “Nurses’ remuneration is positively related to their

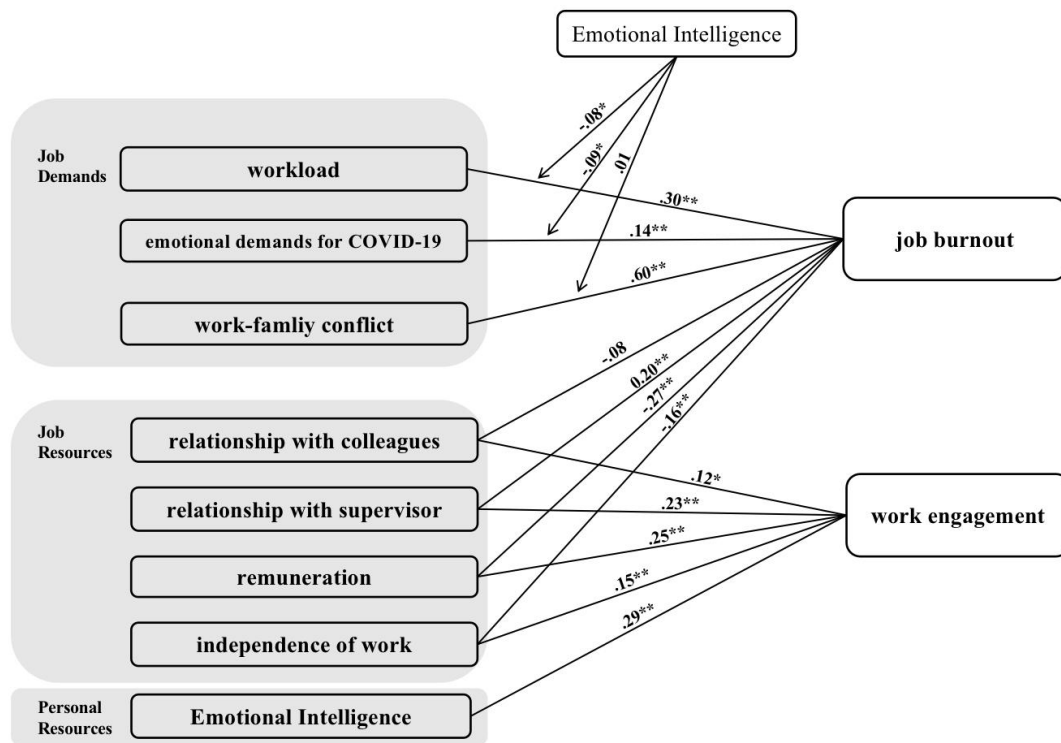
work engagement.”, and hypothesis 4.4. “Nurse’s independence of work is positively related to their work engagement.” In addition, Emotional intelligence ($\beta = .29, p < .001$) was significantly and positively related to work engagement, which supported the hypothesis 4.5 “Emotional intelligence as personal resources is positively related to nurses’ work engagement.”

Table 4.6 Result of Multiple Linear Regression of Engagement with Resources (N=336)

	Model 1 (control variables)				Model 2 (independent variables)			
	B	SE B	p	β	B	SE B	p	β
gender	-0.20	0.29	0.50	-0.04	-0.19	0.24	0.44	-0.04
age	0.13	0.06	0.03	0.13*	0.01	0.05	0.88	0.01
marital status	-0.01	0.10	0.89	-0.01	-0.02	0.08	0.77	-0.01
education	-0.23	0.11	0.03	-0.12*	-0.14	0.09	0.12	-0.07
department	0.01	0.02	0.55	0.03	0.02	0.02	0.27	0.05
organization	-0.10	0.03	0.00	-0.16**	-0.10	0.03	0.00	-0.16**
relationship with colleagues					0.12	0.05	0.02	0.12*
relationship with supervisor					0.23	0.05	0.00	0.23**
remuneration					0.25	0.04	0.00	0.25**
independence of work					0.15	0.06	0.01	0.15**
emotional intelligence					0.29	0.06	0.00	0.29**
R ²			0.07				0.40	
Adjusted R ²			0.06				0.38	
F value	$F(6, 329) = 4.340, p < .001$				$F(11, 324) = 19.718, p < .001$			
ΔR^2			0.07				0.33	
ΔF value			4.34				35.45	

Note. Dependent variable: Work Engagement. * $p < .05$. ** $p < .01$.

In conclusion, the regression analysis in this research can be summarized as Figure 2.



Note.* $p < .05$. ** $p < .01$.

Figure 2. Result of Multiple Linear Regression

4.4.3 Comparing Groups Regression for Job Burnout by Job Demands

To explore how COVID-19 changed the relationship between job demands and burnout among nurses, the multiple linear regression analysis was conducted with control variables. According to the item of “frequency involved in COVID-19 work”, nurses never, rarely and occasionally involved in the work for COVID-19, were considered as “low frequency group”, and nurses took part in COVID-19 related work frequently (several times a month), usually (several times a week), and everyday, were considered as “high frequency group”. Two regression models were tested for these two groups of nurses (Table 4.7, Table 4.8).

Job burnout for nurses involved in COVID-19 work less frequently was positively related with workload ($\beta = .32, p < .001$), and work-family conflict ($\beta = .56, p < .001$), however, emotional demands for COVID-19 ($\beta = .03, p = .62$) not statistically significant association among these group. The coefficient of workload for the high frequency group ($\beta = .27, p < .001$) was lower than that for the low frequency group, which suggested that with each additional workload, the increase of job burnout for the high frequency group was lower. It

cannot support hypothesis 2.1 “Workload is more positively related to job burnout among nurses more frequently involved in COVID-19 work.” The coefficient of emotional demands for COVID-19 ($\beta = .03, p < .001$) and work-family conflict for high frequency group ($\beta = .62, p < .001$) were higher than that for low frequency group. And these results support hypothesis 2.2. “Emotional demands for COVID-19 is more positively related to job burnout among nurses more frequently involved in COVID-19 work.” and hypothesis 2.3. “Work-family conflict (WFC) is more positively related to job burnout among nurses more frequently involved in COVID-19 work.”

Table 4.7 Result of Multiple Linear Regression of Burnout by Job Demands among low frequency group (N=147)

	Model 1 (control variables)				Model 2 (independent variables)			
	B	SE B	p	β	B	SE B	p	β
gender	-0.40	0.51	0.43	-0.06	-0.39	0.42	0.35	-0.06
age	-0.06	0.09	0.53	-0.05	-0.14	0.08	0.06	-0.12
marital status	0.11	0.14	0.42	0.07	0.27	0.11	0.02	0.17*
education	0.24	0.14	0.09	0.13	-0.04	0.12	0.74	-0.02
organization	0.20	0.05	0.00	0.34**	0.07	0.04	0.12	0.11
workload					0.27	0.06	0.00	0.32**
emotional demands for COVID-19					0.03	0.06	0.62	0.03
work-family conflict					0.53	0.07	0.00	0.56**
R ²			0.15				0.46	
Adjusted R ²			0.12				0.42	
F value	$F(5, 141) = 5.02, p < .001$				$F(8, 138) = 14.43, p < .001$			
ΔR^2			0.15				0.31	
ΔF value			5.02				25.73	

Note. Dependent variable: Job burnout. * $p < .05$. ** $p < .01$.

Table 4.8 Result of Multiple Linear Regression of Burnout by Job Demands among high frequency group (N=189)

	Model 1 (control variables)				Model 2 (independent variables)			
	B	SE B	p	β	B	SE B	p	β
gender	-0.50	0.37	0.17	-0.10	-0.27	0.26	0.29	-0.06
age	-0.11	0.08	0.18	-0.11	-0.17	0.06	0.00	-0.17

marital status	-0.02	0.13	0.90	-0.01	0.01	0.09	0.96	0.00
education	0.25	0.16	0.12	0.12	-0.05	0.11	0.65	-0.03
organization	0.05	0.05	0.27	0.08	0.04	0.03	0.30	0.06*
workload					0.34	0.06	0.00	0.27**
emotional demands for COVID-19					0.19	0.05	0.00	0.19**
work-family conflict					0.64	0.05	0.00	0.62**
R ²			0.06				0.55	
Adjusted R ²			0.04				0.53	
F value			$F(5, 183) = 2.48, p = .03$			$F(8, 180) = 27.88, p < .001$		
ΔR^2			0.06				0.49	
ΔF value			2.48				65.83	

Note. Dependent variable: Job burnout. * $p < .05$. ** $p < .01$.

5. Discussion and Conclusion

5.1 Discussion

5.1.1 Descriptive

Of 336 nurses investigated from February to March, 2022 in Guangdong Province, China, most nurses (85.2%) were involved in COVID-19 work in the last 3 months, and 32.1% involved everyday. The major COVID-19 related work includes nucleic acid testing, epidemiological investigation, and pairing assistance. Pairing assistance is a national strategy in China for one province or a major city to provide assistance to a designated region in need of help.

The mean of burnout among nurses was 3.73 ± 1.17 of a 6-point scale from 1= never to 6=always. Compared with 23.95 ± 11.1 of 7-point scale (0= never, 6= always) (Wang et al., 2015), nurses burnout status (3.73 vs. 4.19) was lower than that before the pandemic period. Compared with 15.64 ± 5.97 of 7-point scale (0= never, 6= always) (Yang et al., 2021), nurses burnout (3.73 vs. 2.81) was higher than that in the early period of COVID-19. The mean of nurses' engagement was 4.17 ± 1.11 of 6-point scale from 1= never to 6=always. Compared with 3.44 ± 1.52 of 7-point scale from 0 to 6 (Wan, Zhou, et al., 2018), nurses' engagement (4.17 vs. 3.87) was higher than that before COVID-19. Comparing with 34.13 ± 8.82 of the 6-point scale from 0 to 6, nurses' engagement (4.17 vs. 4.16) in a recent study (Zhang et al., 2021), nurses' engagement was marginally higher than that in the early period of COVID-19.

5.1.2 Variance Discussion

Two groups have been classified according to the frequency of nurses involved in COVID-19 related work, namely the high frequency group (N = 147, 43.7%) and low frequency group (N = 189, 56.3%). Though nurses involved more frequently in the COVID-19 work had higher workload ($5.26 \pm .87$), the burnout status had no significant difference between these two groups (high frequency group: 3.70 ± 1.24 ; low frequency group: 3.75 ± 1.08). This may indicate that the burnout level is stable within nurses occupation. The possible reason for this

is that nurses of low frequency have lower emotional intelligence ($4.43 \pm .66$) than high frequency group ($4.56 \pm .68$), and emotional intelligence moderates the relationship between workload and burnout. The engagement status of nurses more frequently involved in COVID-19 work was significantly higher than that of another group (high frequency group: 4.31 ± 1.1 ; low frequency group: 3.98 ± 1.1). This may be related to higher levels of relationships with colleagues ($4.79 \pm .77$) and supervisor ($4.71 \pm .89$) and higher emotional intelligence ($4.56 \pm .68$) they had.

Nurses' burnout is related to demographic characteristics like age, marital status, education level, and organization. Nurses aged from 18 to 29, unmarried, and with bachelor degree have higher mean of burnout, and nurses aged from 40 to 49, married, with education level at colleagues or below have higher level of work engagement. Many researches mentioned the higher level of burnout among younger and unmarried nurses (Ohue et al., 2011; Okwaraji & En, 2014; Xie et al., 2011). Adekola (2010) suggested that family-life is a rewarding resource, and individuals who share housework and family responsibilities are less prone to burnout. This may explain the higher burnout among young and unmarried nurses, and indicated that more attention need to be paid on young and unmarried nurses.

5.1.3 Hypothesis Testing

Nurses' burnout is positively related to workload ($\beta = .30$, $p < .001$), emotional demands for COVID-19 ($\beta = .14$, $p = .001$), and work-family conflict ($\beta = .60$, $p < .001$). The impact of work-family conflict on nurses' burnout was higher than that of emotional demands for COVID-19 and workload. This result could be explained with the fact that the nurses in this research were mainly female (96.4%), and females are taking on more family responsibilities like childcare in China. The family demands increase because of the schools closing and childcare services and the development of remote education (Rudolph et al., 2021). And the absence at work due to the child care responsibilities is likely to increase the work-family conflict (Fujimoto et al., 2008). The technology overload due to remote education and working can also increase the work-family conflict (Ghislieri et al., 2021). These findings indicated that the reducing the work-family conflict is important for nurses' burnout management. In

addition, nurses' burnout is negatively related to relationship with supervisor ($\beta = -.20$, $p < .001$), remuneration ($\beta = -.27$, $p < .001$), and independence of work ($\beta = -.16$, $p = .001$). This may be explained by the COR theory, resources loss lead to burnout (Hobfoll, 1989). The impact of remuneration on nurses' burnout was the highest among the four job resources in this research. This result indicated that the finance rewards in the job is important and the increase of remuneration can lower the job burnout level.

The degree of relationship between the three job demands and nurses' burnout is different according to the frequency of involvement of COVID-19 related work. The relationship between workload and burnout is less positive among nurses more frequently involved in COVID-19 work. The possible reason for this result is that nurses more frequently involved in COVID-19 related work have higher levels of emotional intelligence which personal resources can moderate the relationship between workload and burnout. And the principle of voluntary participation in COVID-19 work among nurses may indicate that nurses among high frequency group are more engaged in their work than others. Another possible reason is that nurses among low frequency group undertake more daily nursing work in the department and these resources lead to burnout finally. This indicated that the influence of COVID-19 exist not only among nurses more frequently involved in COVID-19 work need to be noticed but also among nurses less involved in COVID-19 work, so the care about nurses with low frequency is necessary.

The relationship between emotional demands for COVID-19 and burnout is more positive among nurses more frequently involved in COVID-19 work. The increase of concern about infection in the work has been mentioned in many researches (Falco et al., 2021; Fernandez et al., 2020; Lasalvia et al., 2021; Liu et al., 2020; Shu-Ching et al., 2020; Zhu et al., 2021). Nurses frequently participating in COVID-19 related work may attribute these emotional demands to their job, so their burnout is more related to emotional demands for COVID-19 than others. In addition, work-family conflict is more positively related to burnout among nurses more frequently involved in COVID-19 work. This may be explained with the fact that the COVID-19 related work may isolate them with their family for safety reasons and

lockdown policy, and this affect their family-life.

Nurses' engagement is positively related to relationship with colleagues ($\beta = .12$, $p = .02$), relationship with supervisor ($\beta = .23$, $p < .001$), remuneration ($\beta = .25$, $p < .001$), independence of work ($\beta = .15$, $p = .01$), and emotional intelligence ($\beta = .29$, $p < .001$). The relationship has been mentioned in previous researches (Garcia-Sierra et al., 2016; Kim et al., 2020). The impact of personal resources, namely emotional intelligence, on nurses' engagement is higher than other resources. This recognizes the importance of emotional intelligence of nurses, and indicates that emotional intelligence may become a work allocation standard for nurses. The relationship with supervisor is more important than with colleagues, and the possible reason for this results is that the support and feedback from supervisors are related to other resources gain. Besides, remuneration is another important factor for nurses' engagement.

The moderating effect of emotional intelligence exists on special job demands and burnout. Emotional intelligence weakens the positive relationship between workload and burnout, in another word, individuals with higher emotional intelligence are less prone to related workload with burnout. Emotional intelligence as personal resources can balance the relationship between resources loss from job demands and the resources they have, according to the COR theory (Cuyper et al., 2021). In addition, emotional intelligence enhances the relationship between emotional demands and burnout, which may explain this result is that nurses with higher emotional intelligence are more sensitive to others' emotions, and thus they suffered more emotional resources loss than others.

5.2 Implications and Contribution

5.2.1 Implications for Practice

Job burnout among nurses leads to low quality of medical care and more medical errors, and higher levels of work-related infections (Dyrbye et al. 2019), and individuals with higher work engagement experience better health conditions, and perform better (Bakker et al., 2014). The analysis of possible associations with nurses' burnout and engagement in the context of

COVID-19 pandemic in this research gives support for burnout management.

Hospital managers could assign more work to those nurses with higher emotional intelligence, due to the fact that nurses' emotional intelligence can weaken the relationship between workload and burnout. And managers need to introduce the strategy for lowering the nurse' burnout. The impact of work-family conflict on burnout is stronger than others, which indicates that the work-family balance measurement is necessary. The measurement could be like child care for those children attending online education, to decrease the conflict between family and work. To decrease the emotional demands for COVID-19, especially for nurses more frequently involved in COVID-19 work, hospital managers can introduce psychological intervention for nurses. In addition, job resources highly related to burnout and engagement also need to be managed. Remuneration is highly related with nurses' burnout and engagement, hospital managers may increase financial rewards among nurses, and reform the reward distribution among nurses. Managers also need to pay attention to the relationship with supervisor and independence of work, for example, increase the courses for supervisors teaching the measurement of relationship with subordinates.

Policy-makers could introduce the regulations to protect the health and safety of nurses by introducing minimum rules relating to daily and weekly rest periods,length of working week, and on night work, like the European Working Time Directive, to ensure that nurses can work without over workload. In addition, introduce the regulations to protect the remuneration of nurses fairly and reasonably.

5.2.2 Theoretical Contribution

This research analyzes the Chinese nurses' burnout and engagement during COVID-19 outbreak by using the JD-R model. This research enriches the literature in JD-R practice in Chinese nurses during COVID-19 period, and gives theoretical support for the nurses' human management practice against COVID-19.

5.3 Limitation and Future Study

The study also had the following limitations. The sample of this research was collected in one province in China, the data cannot represent the average level of Chinese nurses. The job demands and resources examined in this research are limited. Future research may carry out surveys among nurses in a larger scope and test more JD-R variables.

5.4 Conclusion

During the outbreak of COVID-19, the majority of Chinese nurses were involved in the preventing and controlling work of COVID-19. Nurses burnout is lower than non-epidemic period, but higher than the early period of COVID-19 outbreak. Nurses' engagement is higher than both non-epidemic period and early period of outbreak. For nurses highly involved in COVID-19 work, the outbreak of COVID-19 increased their workload, relationship with colleagues and supervisor, and work engagement.

Nurses' burnout can be positively affected by workload, emotional demands for COVID-19, and work-family conflict, and be negatively affected by relationship with supervisor, remuneration, and independence of work. The impact of work-family conflict, workload and remuneration on burnout is higher than others. Workload is less positively related to job burnout among nurses more frequently involved in COVID-19 work than them with low frequency. Emotional demands for COVID-19 is more positively related to job burnout among nurses more frequently involved in COVID-19 work. Emotional intelligence weakens the relationship between workload and burnout, and enhances the relationship between emotional demands for COVID-19 and burnout.

Nurses' engagement can be positively related to relationship with supervisor and colleagues, remuneration, independence of work, and emotional intelligence. The personal resources, namely emotional intelligence, has the strongest impact on engagement among these variables. And the impact of remuneration and relationship with supervisor is stronger than other job resources.

Reference

- Abendroth, M., & Flannery, J. (2006). Predicting the risk of compassion fatigue: A study of hospice nurses. *Journal of Hospice & Palliative Nursing*, 8(6), 346-356.
- Adekola, B. (2010). Gender differences in the experience of work burnout among university staff. *African Journal of business management*, 4(6), 886-889.
- Al-Rabiaah, A., Temsah, M. H., Al-Eyadhy, A. A., Hasan, G. M., Al-Zamil, F., Al-Subaie, S., ... & Somily, A. M. (2020). Middle East Respiratory Syndrome-Corona Virus (MERS-CoV) associated stress among medical students at a university teaching hospital in Saudi Arabia. *Journal of infection and public health*, 13(5), 687-691.
- Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of managerial psychology*, 22(3), 309–328.
- Bakker, A. B., & Demerouti, E. (2014). Job demands–resources theory. *Wellbeing: A complete reference guide*, 1-28.
- Bakker, A. B., Demerouti, E., & Sanz-Vergel, A. I. (2014). Burnout and work engagement: The JD–R approach. *Annu. Rev. Organ. Psychol. Organ. Behav.*, 1(1), 389-411.
- Bakker, A. B., Demerouti, E., Taris, T. W., Schaufeli, W. B., & Schreurs, P. J. (2003). A multigroup analysis of the job demands-resources model in four home care organizations. *International Journal of stress management*, 10(1), 16.
- Bakker, A. B., Hakanen, J. J., Demerouti, E., & Xanthopoulou, D. (2007). Job resources boost work engagement, particularly when job demands are high. *Journal of educational psychology*, 99(2), 274.

- Bar-On, R. (1997). The Emotional Intelligence Inventory (EQ-I): Technical manual. *Toronto: Multi-Health Systems.*
- Bhatti, M. A., Hussain, M. S., & Al Doghan, M. A. (2018). The role of personal and job resources in boosting nurses' work engagement and performance. *Global Business and Organizational Excellence*, 37(2), 32-40.
- Broetje, S., Jenny, G. J., & Bauer, G. F. (2020). The key job demands and resources of nursing staff: An integrative review of reviews. *Frontiers in Psychology*, 11, 84.
- Camerino, D., Sandri, M., Sartori, S., Conway, P. M., Campanini, P., & Costa, G. (2010). Shiftwork, work-family conflict among Italian nurses, and prevention efficacy. *Chronobiology international*, 27(5), 1105-1123.
- Cotel, A., Golu, F., Pantea Stoian, A., Dimitriu, M., Socea, B., Cirstoveanu, C., ... & Oprea, B. (2021). Predictors of burnout in healthcare workers during the COVID-19 pandemic. In *Healthcare* (Vol. 9, No. 3, p. 304). *Multidisciplinary Digital Publishing Institute.*
- Chen, S. C., & Chen, C. F. (2018). Antecedents and consequences of nurses' burnout: Leadership effectiveness and emotional intelligence as moderators. *Management Decision*.
- Chen Quan. (2013). Research on the impact of emotional intelligence on executive team conflict, behavior integration and strategic decision-making performance (PhD dissertation, Jiangsu University).
<https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CDFD1214&filename=1014136623.nh>
- Crawford, E. R., LePine, J. A., & Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: a theoretical extension and meta-analytic test. *Journal of applied psychology*, 95(5), 834.

- Cuyper N D, Mäkikangas A, Kinnunen U. (2021) Cross-lagged associations between perceived external employability, job insecurity, and exhaustion: Testing gain and loss spirals according to the conservation of resources theory. *Journal of Organizational Behavior*, 33(6):770-788
- Dall'Ora, C., Ball, J., Reinius, M., & Griffiths, P. (2020). Burnout in nursing: a theoretical review. *Human resources for health*, 18(1), 1-17.
- Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied psychology*, 86(3), 499.
- Dyrbye, L. N., Shanafelt, T. D., Johnson, P. O., Johnson, L. A., Satele, D., & West, C. P. (2019). A cross-sectional study exploring the relationship between burnout, absenteeism, and job performance among American nurses. *BMC nursing*, 18(1), 1-8.
- Falco, A., Girardi, D., Dal Corso, L., Yildirim, M., & Converso, D. (2021). The perceived risk of being infected at work: An application of the job demands–resources model to workplace safety during the COVID-19 outbreak. *PloS one*, 16(9), e0257197.
- Fernandez, R., Lord, H., Halcomb, E., Moxham, L., Middleton, R., Alananzeh, I., & Ellwood, L. (2020). Implications for COVID-19: A systematic review of nurses' experiences of working in acute care hospital settings during a respiratory pandemic. *International journal of nursing studies*, 111, 103637.
- Freudenberger, H. J. (1974). Staff burnout. *Journal of social issues*, 30(1), 159-165.
- Fujimoto, T., Kotani, S., & Suzuki, R. (2008). Work–family conflict of nurses in Japan. *Journal of clinical nursing*, 17(24), 3286-3295.

- Garcia-Sierra, R., Fernandez-Castro, J., & Martinez-Zaragoza, F. (2016). Work engagement in nursing: an integrative review of the literature. *Journal of nursing management*, 24(2), E101-E111.
- Garrosa, E., Moreno-Jiménez, B., Rodríguez-Muñoz, A., & Rodríguez-Carvajal, R. (2011). Role stress and personal resources in nursing: A cross-sectional study of burnout and engagement. *International journal of nursing studies*, 48(4), 479-489.
- Geurts, S. A., Taris, T. W., Kompier, M. A., Dijkers, J. S., Van Hooff, M. L., & Kinnunen, U. M. (2005). Work-home interaction from a work psychological perspective: Development and validation of a new questionnaire, the SWING. *Work & Stress*, 19(4), 319-339.
- Ghislieri, C., Molino, M., Dolce, V., Sanseverino, D., & Presutti, M. (2021). Work-family conflict during the Covid-19 pandemic: teleworking of administrative and technical staff in healthcare. An Italian study. *La Medicina del lavoro*, 112(3), 229.
- Gorgens-Ekermans, G., & Brand, T. (2012). Emotional intelligence as a moderator in the stress–burnout relationship/ a questionnaire study on nurses. *Journal of clinical nursing*, 21(15-16), 2275-2285.
- Gretchen Berlin, RN; Meredith Lapointe; and Mhoire Murphy. Healthcare Systems & Services ... - emergingrnleader.com. Surveyed nurses consider leaving direct patient care at elevated rates. Retrieved February 2022, from <https://www.emergingrnleader.com/wp-content/uploads/2022/02/Mckinsey-Report-2022.pdf>
- Jenaro, C., Flores, N., Orgaz, M. B., & Cruz, M. (2011). Vigour and dedication in nursing professionals: towards a better understanding of work engagement. *Journal of advanced nursing*, 67(4), 865-875.

- Jin Y.H., Cai L., Cheng Z.S., Cheng H., Deng T., Fan Y.P.... & Research Group on Prevention and Treatment of Novel Coronavirus Infected Pneumonia in Zhongnan Hospital of Wuhan University. (2020). Rapid diagnosis and treatment of COVID-19 Guidelines (Standard Edition). *PLA Medical Journal* (01), 1-20.
- Hobfoll, S. E. (1989). Conservation of resources: a new attempt at conceptualizing stress. *American psychologist*, 44(3), 513.
- Hobfoll, S. E., Johnson, R. J., Ennis, N., & Jackson, A. P. (2003). Resource loss, resource gain, and emotional outcomes among inner city women. *Journal of personality and social psychology*, 84(3), 632.
- Hu, D., Kong, Y., Li, W., Han, Q., Zhang, X., Zhu, L. X., ... & Zhu, J. (2020). Frontline nurses' burnout, anxiety, depression, and fear statuses and their associated factors during the COVID-19 outbreak in Wuhan, China: A large-scale cross-sectional study. *EClinicalMedicine*, 24, 100424.
- Hu, Q., Schaufeli, W. B., & Taris, T. W. (2017). How are changes in exposure to job demands and job resources related to burnout and engagement? A longitudinal study among Chinese nurses and police officers. *Stress and Health*, 33(5), 631-644.
- Huang, J., Wang, Y., & You, X. (2016). The job demands-resources model and job burnout: The mediating role of personal resources. *Current Psychology*, 35(4), 562-569.
- Kim, Y. J., Lee, S. Y., & Cho, J. H. (2020). A study on the job retention intention of nurses based on social support in the COVID-19 situation. *Sustainability*, 12(18), 7276.
- Lasalvia, A., Amadeo, F., Porru, S., Carta, A., Tardivo, S., Bovo, C., ... & Bonetto, C. (2021). Levels of burn-out among healthcare workers during the COVID-19 pandemic and their associated factors: a cross-sectional study in a tertiary hospital of a highly burdened area of north-east Italy. *BMJ open*, 11(1), e045127.

- Lee, R. T., & Ashforth, B. E. (1996). A meta-analytic examination of the correlates of the three dimensions of job burnout. *Journal of applied Psychology*, 81(2), 123.
- Lequeurre, J., Gillet, N., Ragot, C., & Fouquereau, E. (2013). Validation of a French questionnaire to measure job demands and resources. *Revue internationale de psychologie sociale*, 26(4), 93-124.
- Liao, H., & Yan, A. (2014). The effects, moderators and mechanism of emotional labor. *Advances in Psychological Science*, 22(9), 1504.
- Liu, X., Chen, J., Wang, D., Li, X., Wang, E., Jin, Y., ... & Hou, X. (2020). COVID-19 outbreak can change the job burnout in health care professionals. *Frontiers in Psychiatry*, 11, 1362.
- Li Chaoping, Shi Kan. (2003). The influence of distributional justice and procedural justice on job burnout. *Acta Psychologica Sinica* (05), 677-684.
- Lubbadeh, T., 2020. JOB BURNOUT: A GENERAL LITERATURE REVIEW. *International Review of Management and Marketing*, 10(3), pp.7-15.
- Lu Minghui. (2017). Research on teachers' teaching efficacy and its related factors in special schools (PhD dissertation, East China Normal University).
- Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of organizational behavior*, 2(2), 99-113.
- Maslach, C., Jackson, S. (1984), Burnout in organization settings. *Applied Social Psychology Annual*, 5(1), 133-153.
- Maslach C, Leiter MP. (1997), The Truth About Burnout: How Organizations Cause Personal Stress and What to Do About It. San Francisco, CA: Jossey-Bass

- Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual review of psychology*, 52(1), 397-422.
- Mason, V. M., Leslie, G., Clark, K., Lyons, P., Walke, E., Butler, C., & Griffin, M. (2014). Compassion fatigue, moral distress, and work engagement in surgical intensive care unit trauma nurses: a pilot study. *Dimensions of Critical Care Nursing*, 33(4), 215-225.
- Mayer, J. D., Caruso, D., & Salovey, P. (1999). Emotional intelligence meets traditional standards for an intelligence. *Intelligence*, 27, 267-298.
- McVicar, A. (2016). Scoping the common antecedents of job stress and job satisfaction for nurses (2000–2013) using the job demands–resources model of stress. *Journal of nursing management*, 24(2), E112-E136.
- Miawati, T., Tukiran, M., & Anggorodi, R. (2021). Work Engagement in Nurses during The Covid-19 Pandemic: A Literature Review. *Journal of Industrial Engineering & Management Research*, 2(4), 131-137.
- Missouridou, E. (2017). Secondary posttraumatic stress and nurses' emotional responses to patient's trauma. *Journal of Trauma Nursing/ JTN*, 24(2), 110-115.
- Moloney, W., Boxall, P., Parsons, M., & Cheung, G. (2018). Factors predicting Registered Nurses' intentions to leave their organization and profession: A job demands-resources framework. *Journal of advanced nursing*, 74(4), 864-875.
- Nantsupawat, A., Nantsupawat, R., Kunaviktikul, W., Turale, S., & Poghosyan, L. (2016). Nurse burnout, nurse-reported quality of care, and patient outcomes in Thai hospitals. *Journal of Nursing Scholarship*, 48(1), 83-90.
- Nastasa, L. E., & Farcas, A. D. (2015). The effect of emotional intelligence on burnout in healthcare professionals. *Procedia-Social and Behavioral Sciences*, 187, 78-82.

- Netemeyer, R. G., Boles, J. S., & McMurrian, R. (1996). Development and validation of work–family conflict and family–work conflict scales. *Journal of applied psychology*, 81(4), 400.
- Ohue, T., Moriyama, M., & Nakaya, T. (2011). Examination of a cognitive model of stress, burnout, and intention to resign for Japanese nurses. *Japan Journal of Nursing Science*, 8(1), 76-86.
- Okwaraji, F. E., & En, A. (2014). Burnout and psychological distress among nurses in a Nigerian tertiary health institution. *African health sciences*, 14(1), 237-245.
- Ravichandran, K., Arasu, R., & Kumar, S. A. (2011). The impact of emotional intelligence on employee work engagement behavior: An empirical study. *International Journal of Business and Management*, 6(11), 157.
- Rezaei S, Karami Matin B, Hajizadeh M, Soroush A, Nouri B (2018) Prevalence of burnout among nurses in Iran: a systematic review and meta-analysis. *Int Nurs Rev* 65(3):361–369.
- Rosales, R. A., Labrague, L. J., & Rosales, G. L. (2013). Nurses' job satisfaction and burnout/ Is there a connection?. *International Journal of Advanced Nursing Studies*, 2(1), 1.
- Rudolph, C. W., Allan, B., Clark, M., Hertel, G., Hirschi, A., Kunze, F., ... & Zacher, H. (2021). Pandemics: Implications for research and practice in industrial and organizational psychology. *Industrial and Organizational Psychology*, 14(1-2), 1-35.
- Sahay, S., & Wei, W. (2021). Work-Family Balance and Managing Spillover Effects Communicatively during COVID-19: Nurses' Perspectives. *Health Communication*, 1-10.

- Salovey, P., Bedell, B.T., Detweiler, J.B., & Mayer, J.D. (2000). Current directions in emotional intelligence research. In M. Lewis & J.M. Haviland-Jones (Eds.), *Handbook of emotions* (pp. 504–520). *New York: Guilford Press.*
- Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior. The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 25(3), 293-315.
- Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire/ A cross-national study. *Educational and psychological measurement*, 66(4), 701-716.
- Schaufeli WB, Leiter MP, Maslach C, Jackson SE (1996) The Maslach Burnout Inventory-General Survey. In Maslach C, Jackson SE, Leiter MP editors, *Maslach Burnout Inventory 3rd Edition*. *Palo Alto: Consulting Psychologists Press*, 19–26.
- Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness studies*, 3(1), 71-92.
- Schaufeli, W. B., & Taris, T. W. (2014). A critical review of the job demands-resources model: Implications for improving work and health. *Bridging occupational, organizational and public health*, 43-68.
- Schutte, N., Toppinen, S., Kalimo, R., & Schaufeli, W. (2000). The factorial validity of the Maslach Burnout Inventory-General Survey (MBI-GS) across occupational groups and nations. *Journal of Occupational and Organizational psychology*, 73(1), 53-66.

- Seo, Y., Ko, J., & Price, J. L. (2004). The determinants of job satisfaction among hospital nurses: a model estimation in Korea. *International journal of nursing studies*, 41(4), 437-446.
- Shu-Ching, C. H. E. N., Yeur-Hur, L. A. I., & Shiow-Luan, T. S. A. Y. (2020). Nursing perspectives on the impacts of COVID-19. *Journal of Nursing Research*, 28(3), e85.
- Talaei, N., Varahram, M., Jamaati, H., Salimi, A., Attarchi, M., Sadr, M., ... & Seyedmehdi, S. M. (2020). Stress and burnout in health care workers during COVID-19 pandemic: validation of a questionnaire. *Journal of Public Health*, 1-6.
- Trinkoff, A. M., Lipscomb, J. A., Geiger-Brown, J., Storr, C. L., & Brady, B. A. (2003). Perceived physical demands and reported musculoskeletal problems in registered nurses. *American journal of preventive medicine*, 24(3), 270-275.
- Viotti, S., Gilardi, S., Guglielmetti, C., & Converso, D. (2015). Verbal aggression from care recipients as a risk factor among nursing staff: a study on burnout in the JD-R model perspective. *BioMed research international*, 2015.
- Wong, C. S., & Law, K. S. (2002). The effects of leader and follower emotional intelligence on performance and attitude: An exploratory study. *The leadership quarterly*, 13(3), 243-274.
- Wang, S., Liu, Y., & Wang, L. (2015). Nurse burnout: personal and environmental factors as predictors. *International journal of nursing practice*, 21(1), 78-86.
- Wan, Q., Li, Z., Zhou, W., & Shang, S. (2018). Effects of work environment and job characteristics on the turnover intention of experienced nurses: The mediating role of work engagement. *Journal of Advanced Nursing*, 74(6), 1332-1341.

Weng, H. C., Hung, C. M., Liu, Y. T., Cheng, Y. J., Yen, C. Y., Chang, C. C., & Huang, C. K. (2011). Associations between emotional intelligence and doctor burnout, job satisfaction and patient satisfaction. *Medical education*, 45(8), 835-842.

Wheeler HH (1997) A review of nurse occupational stress research: 1. *Br J Nurs* 6:642–645

WHO. 2022a. Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19). [online] Available at:
<https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19---final-report-1100hr-28feb2020-11mar-update.pdf?sfvrsn=1a13fda0_2>
[Accessed 16 February 2022].

WHO. 2022b. Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV). [online] Available at:
<[https://www.who.int/news/item/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-\(2005\)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-\(2019-ncov\)](https://www.who.int/news/item/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov))> [Accessed 20 January 2022].

WHO. 2022c. WHO Coronavirus (COVID-19) Dashboard. [online] Available at:
<<https://covid19.who.int/table>> [Accessed 13 February 2022].

Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2007). The role of personal resources in the job demands-resources model. *International journal of stress management*, 14(2), 121.

Xie, J., Tong, Z., Guan, X., Du, B., Qiu, H., & Slutsky, A. S. (2020). Critical care crisis and some recommendations during the COVID-19 epidemic in China. *Intensive care medicine*, 46(5), 837-840.

- Xie, Z., Wang, A., & Chen, B. (2011). Nurse burnout and its association with occupational stress in a cross-sectional study in Shanghai. *Journal of advanced nursing*, 67(7), 1537-1546.
- Yang R., Wang Y.L., Xue C.J. & Li J.M.. (2021). Analysis of the current situation and related influencing factors of nurses' job burnout during COVID-19 pandemic. *Health Vocational Education* (19), 152-154.
- Yildirim, D., & Aycan, Z. (2008). Nurses' work demands and work–family conflict: A questionnaire survey. *International journal of nursing studies*, 45(9), 1366-1378.
- Yıldırım, M.; Güler, A. (2020). Factor analysis of the COVID-19 Perceived Risk Scale: A preliminary study. *Death Stud.* 1–8.
- Zeidner, M., Matthews, G., & Roberts, R. D. (2004). Emotional intelligence in the workplace: A critical review. *Applied Psychology*, 53(3), 371-399.
- Zhang, M., Zhang, P., Liu, Y., Wang, H., Hu, K., & Du, M. (2021). Influence of perceived stress and workload on work engagement in front-line nurses during COVID-19 pandemic. *Journal of clinical nursing*, 30(11-12), 1584-1595.
- Zhu, Y., Liu, C., Guo, B., Zhao, L., & Lou, F. (2015). The impact of emotional intelligence on work engagement of registered nurses: The mediating role of organisational justice. *Journal of clinical nursing*, 24(15-16), 2115-2124.
- Zhu J., Liang H., Liu Y.C., Lin M.Z., Ye Y., Deng Q.Y.(2021). Investigation on the current situation of job burnout among medical staff during COVID-19 pandemic [J]. *Research and Practice in Healthcare Medicine*, 18(06), 39-43.

Appendixes

Appendixes A-1

Job demands and Job resources

1. I have too much work to do
2. I have to work extra hard in order to complete something
3. I have to hurry
4. Worry about oneself contracting COVID-19
5. Worry about a family member contracting COVID-19 because of me/my work
6. Worry about COVID-19 occurring in the region
7. The demands of my work interfere with my home and family life.
8. The amount of time my job takes up makes it difficult to fulfill family responsibilities.
9. Things I want to do at home do not get done because of the demands my job puts on me.
10. My job produces strain that makes it difficult to fulfill family duties.
11. Due to work-related duties, I have to make changes to my plans for family activities.
12. In my work, I feel appreciated by my colleagues.
13. I get on well with my colleagues.
14. I can count on my colleagues when I encounter difficulties in the work.
15. There a good atmosphere between me and my colleagues.
16. In the work, I feel appreciated by my superior.
17. I can count on my superior when I come across difficulties in the work.
18. I get on well with my superior.
19. There is a good atmosphere between me and my superior.
20. I think my organization pays good salaries.
21. I think I am paid enough for the work that I do.
22. I think I am fairly paid in comparison with other people in my department.

- 23. I can live comfortably on my pay.
- 24. I have an influence on the pace of work.
- 25. I can personally decide how much time I need for a specific activity
- 26. I can decide the order in which I carry out your work on my own.
- 27. I can participate in the decision about when something must be completed.

Note.

1. workload: item 1-3; emotional demands for COVID-19: item 4-6; work-family conflict: item 7-11; relationship with colleague: item 12-15; relationship with supervisor: item 16-19; remuneration: item 20-23; independence of work: item 24-27.

2. Measurement scale: item 1-3, 6-point Likert scale ranging from from 1= never to 6= every day; item 4-27, 6-point Likert scale ranging from from 1=strongly disagree to 6=strongly agree

3. Sources. Lequeurre et al.,2013; Yıldırım et al.,2020; Netemeyer et al., 1996.

Appendixes A-2

Emotional intelligence

1. I have a good sense of why I feel certain feelings most of the time.
2. I have a good understanding of my own emotions.
3. I always understand what I feel.
4. I always know whether I am happy or not.
5. I always know my friends' emotions from their behavior.
6. I am a good observer of others' emotions.
7. I am sensitive to the feelings and emotions of others.
8. I have a good understanding of the emotions of people around me.
9. I always get goals for myself and then try my best to achieve them.
10. I always tell myself I am a competent person.
11. I am a self-motivating person.
12. I would always encourage myself to try my best.
13. I am able to control my temper so that I can handle difficulties rationally.
14. I am quite capable of controlling my own emotions.
15. I can always calm down quickly when I am very angry.
16. I have good control of my emotions.

Note. self-emotions appraisal: item 1-4; others-emotions appraisal: item 5-8; use of emotion: item 9-12; regulation of emotions: item 13-16. measurement scale: 6-point Likert scale from 1=strongly disagree to 6=strongly agree. Source: Wong & Law, 2002.

Appendixes A-3

Job burnout

1. I feel emotionally drained from my work.
2. I feel used up at the end of the workday.
3. I feel fatigued when I get up in the morning and have to face another day on the job.
4. I feel burned out from my work.
5. I feel frustrated by my job.

Note. 6-point Likert scale from 1= never to 6=always. Source: Li Chaoping & Shi Kan, 2003

Appendixes A-4

Work engagement

1. At my work, I feel bursting with energy.
2. At my job, I feel strong and vigorous.
3. I am enthusiastic about my job.
4. My job inspires me.
5. When I get up in the morning, I feel like going to work.
6. I feel happy when I am working intensely.
7. I am proud of the work that I do.
8. I am immersed in my work.
9. I get carried away when I am working.

Note. 6-point Likert scale from 1= never to 6=always. Source: Schaufeli et al., 2006

Appendixes A-4

护士工作倦怠与工作投入的相关研究调查问卷

您好! 首先非常感谢您参与这次问卷调查! 此问卷用于调查研究护士在新冠疫情防控下的工作情况, 据此来制定切实可行的方法来改善护士的工作环境和工作质量。本问卷采用不记名的方式, 对于您提供的所有信息, 仅供研究使用, 绝对保密。再次感谢您的支持!

请认真阅读每个句子, 判断句子中的描述与您的自身情况符合程度, 遇到难选的, 或者是实际情况没遇到的, 请按第一直觉选。

1= never—> 6= always

- | | | | | | | |
|-------------------|---|---|---|---|---|---|
| 1 我有很多的工作要做 | 1 | 2 | 3 | 4 | 5 | 6 |
| 2 为了完成工作, 我需要额外努力 | 1 | 2 | 3 | 4 | 5 | 6 |
| 3 我必须很快地工作 | 1 | 2 | 3 | 4 | 5 | 6 |

1=strongly disagree —> 6=strongly agree

- | | | | | | | |
|-------------------------------|---|---|---|---|---|---|
| 4 我很担心自己感染新冠肺炎 | 1 | 2 | 3 | 4 | 5 | 6 |
| 5 我很担心家人因为我/我的工作而感染新冠肺炎 | 1 | 2 | 3 | 4 | 5 | 6 |
| 6 我很担心我所在的医院有新冠肺炎病例出现 | 1 | 2 | 3 | 4 | 5 | 6 |
| 7 我的工作要求与家庭生活有冲突 | 1 | 2 | 3 | 4 | 5 | 6 |
| 8 我的工作占用了我大量的时间, 这让我很难尽到家庭的责任 | 1 | 2 | 3 | 4 | 5 | 6 |
| 9 家中很多事情没时间做, 因为我工作上的事情太多了 | 1 | 2 | 3 | 4 | 5 | 6 |
| 10 工作产生的压力使我很难履行家庭责任 | 1 | 2 | 3 | 4 | 5 | 6 |
| 11 因为工作上的事情, 家庭活动计划经常要改 | 1 | 2 | 3 | 4 | 5 | 6 |
| 12 在我的工作中, 我感受到同事的赞赏 | 1 | 2 | 3 | 4 | 5 | 6 |
| 13 我和同事相处得很好 | 1 | 2 | 3 | 4 | 5 | 6 |
| 14 当我在工作中遇到困难时, 我能依靠我的同事 | 1 | 2 | 3 | 4 | 5 | 6 |
| 15 我和同事之间的气氛很好 | 1 | 2 | 3 | 4 | 5 | 6 |
| 16 在我的工作中, 我感受到领导的赏识 | 1 | 2 | 3 | 4 | 5 | 6 |
| 17 当我在工作中遇到困难时, 我的上级会给予我指导 | 1 | 2 | 3 | 4 | 5 | 6 |

18 我和上级相处得很好	1	2	3	4	5	6
19 我和我的上级之间有良好的氛围	1	2	3	4	5	6
20 我觉得我的医院工资不错	1	2	3	4	5	6
21 我认为我所做的工作得到了足够的报酬	1	2	3	4	5	6
22 与我所在科室中的其他人相比, 我认为我所得的薪酬合理	1	2	3	4	5	6
23 我能靠我的薪水过上舒适的生活	1	2	3	4	5	6
24 我能决定我的工作节奏	1	2	3	4	5	6
25 我能自己决定一项工作任务所需要的时间	1	2	3	4	5	6
26 我能决定我自己工作的轻重缓急	1	2	3	4	5	6
27 我能参与决定什么时候必须完成某件工作	1	2	3	4	5	6
28 通常我能知道自己会有某些感受的原因	1	2	3	4	5	6
29 我很了解自己的情绪	1	2	3	4	5	6
30 我真的能明白自己平时的感受	1	2	3	4	5	6
31 我通常知道自己是否开心	1	2	3	4	5	6
32 我常常能从朋友的行为中洞察到他们的情绪	1	2	3	4	5	6
33 我观察别人情绪的能力很强	1	2	3	4	5	6
34 我能敏锐地洞悉别人的情绪和感受	1	2	3	4	5	6
35 我很了解身边的人的情绪	1	2	3	4	5	6
36 我通常为自己制定目标并尽我所能地实现这些目标	1	2	3	4	5	6
37 我常常告诉自己是能干的人	1	2	3	4	5	6
38 我是一个能自我激励的人	1	2	3	4	5	6
39 我经常鼓励自己要尽量做到最好	1	2	3	4	5	6
40 我能控制自己的脾气, 理性地处理棘手问题	1	2	3	4	5	6
41 我对自己的情绪有较强的控制能力	1	2	3	4	5	6
42 当我愤怒时, 我通常能在很短的时间内冷静下来	1	2	3	4	5	6
43 我能控制自己的情绪	1	2	3	4	5	6

1= never—> 6= always

44	工作让我感到身心俱疲	1	2	3	4	5	6
45	下班的时候我感觉精疲力竭	1	2	3	4	5	6
46	早上起床不得不去面对一天的工作时，我感觉非常累	1	2	3	4	5	6
47	整天工作对我来说确实压力很大	1	2	3	4	5	6
48	工作让我有快要崩溃的感觉	1	2	3	4	5	6
49	工作时，我感觉迸发能量	1	2	3	4	5	6
50	工作时，我感觉精力充沛	1	2	3	4	5	6
51	我对工作充满热情	1	2	3	4	5	6
52	我的工作一直激励着我	1	2	3	4	5	6
53	当我早上醒来时，我就想要工作	1	2	3	4	5	6
54	当我紧张的工作时，我会感觉很快乐	1	2	3	4	5	6
55	我以我的工作感到自豪	1	2	3	4	5	6
56	我沉浸在我的工作中	1	2	3	4	5	6
57	当我工作时，我会忘乎所以	1	2	3	4	5	6