

RESEARCH ARTICLE

Impact of job control on hospital workers' safety performance: A moderated mediation analysis of the influences of hospital safety climate and social support

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Email: zhao_guolong@126.com**Abstract**

Aim: To improve the level of hospital workers' safety performance in response to emergencies (e.g. COVID-19), this paper examines the relationship between hospital workers' job control on safety performance, and the mediating role of hospital safety climate and the moderating role of social support.

Design: In this cross-sectional questionnaire survey, a convenience sampling of hospital workers from three hospitals that have COVID-19 cases from Beijing and Shandong Province in China.

Methods: These questionnaires were used to obtain self-reported data on hospital workers' job control, hospital safety climate, social support and safety performance. Mplus software was used to calculate CFA. SPSS25.0 software was used to calculate mean values, standard deviations, correlations and regression analyses.

Results: The participants were 241 hospital workers from three hospitals in China (male = 55.2%, female = 44.8%; age range <30 to >45; physician = 58%, nurse = 22%, other hospital worker = 20%). A moderated mediation model among job control, hospital safety climate, social support and safety performance was supported. Moderated mediation analysis indicates hospital workers' job control effectively improves the level of safety performance; hospital safety climate plays a partially mediating role in the process of job control affecting hospital workers' safety performance; social support moderates the effect of work control on medical workers' safety climate. Hence, it is important to increase job control and hospital safety climate. Further, social support for hospital workers should be encouraged, advocated and supported.

KEYWORDS

COVID-19, hospital safety climate, job control, medical staff, safety performance, social support

1 | INTRODUCTION

The coronavirus disease (COVID-19) broke out worldwide in the first half of 2020 (Zhao et al., 2020) has placed a heavy burden on society as the pandemic has hit health systems and economic sectors hard (Al-Bsheish et al., 2021). Although China's basic medical and health care system has developed rapidly in the last 40 years, it is difficult to eliminate thoroughly safe accidents from ED (emergency department) in the face of major epidemic diseases, such as COVID-19. Previous studies on employee safety performance initially focussed on safety-specific determinants (e.g. availability of personal protective equipment) and safety equipment (DeJoy et al., 2000). But some studies have begun to investigate the safety-related behaviours that precede and may prevent workplace injuries (e.g. Hofmann et al., 2003; Turner et al., 2005; Neal & Griffin, 2006; Al-Bsheish et al., 2019; Ashour & Hassan, 2019; Al-Bsheish et al., 2021) and general work characteristics such as job demands, job control and social support to predict employee safety performance (Turner et al., 2012; Ashour & Hassan, 2019). The best way to slow down COVID-19 is the commitment to safety behaviour (Al-Bsheish et al., 2019), such as public safety compliance (PSC). Such PSC behaviours are broader than traditional safety compliance in terms of target groups because PSC is concerned with public-related safety tasks regardless of someone's safety knowledge (Al-Bsheish et al., 2021). Further, PSC behaviours may be influenced by individual psychology and organizational climates, such as job control, safety climate or social support.

Job control is defined as the extent to which employees perceive that they have autonomy over the timing and methods of their work (Turner et al., 2012). It is an employee's capacity to control work tasks, work environment and work task outcomes (Snyder et al., 2008). Employees that can choose how they work and schedule job tasks in a way that makes sense to them would be characterized as having high job control. There is some sound previous work that reviews the relationship between job control and occupational health (Häusser et al., 2010; Rosen & Sascha, 2019; van der Doef & Maes, 1998) and positive safety citizenship (Snyder et al., 2008). According to self-determination theory (SDT), increasing the level of safety motivation of hospital workers can motivate their safety behaviours (Li et al., 2019), or in other words, high employee involvement in activities aimed at improving workplace safety. Overall, the main results indicate that low-control jobs are associated with lower general psychological well-being, lower job satisfaction and psychological distress (Rosen & Sascha, 2019). Hospital workers' job control may allow them to feel more freedom, autonomy and flexibility in their decision-making process, increase their safety responsibility and safety awareness and improve their motivation to be safe at work. Job control also facilitates the formation of a positive safety climate in the organization, which was found to significantly predict hospital safety performance (Rosen et al., 2010).

Besides, a hospital safety climate cannot be achieved without interaction and social support between individuals in an organization (Turner et al., 2012). Social support is defined as the extent to which

employees feel they can count on their colleagues for work-related assistance. According to self-determination theory (SDT), there are three basic needs for intrinsic motivation: autonomy, competence and relatedness. Job control is satisfied with the needs of autonomy and competence. Social support is satisfied with the need for relatedness. From the perspective of individual psychology, social support may directly influence safety climate as a moderating variable and then safety performance.

Yet there is little empirical evidence linking hospital workers' behaviours with safety outcomes (Rosen et al., 2010). Rosen and Sascha (2019) indicate future research should focus on definite occupational groups and tasks related to job control and outcomes. Consequently, this paper constructs a moderated mediating effect model based on self-determination theory to clarify the mechanism of effect between hospital workers' job control, hospital safety climate and safety performance, and the boundary conditions of social support. The goal of the paper is to explore the associations between individual psychological factors (i.e. job control, hospital safety climate and perceived social support) and safety outcomes (i.e. safety performance) for hospital workers by testing the moderated mediation model and practice guidance for hospital workers to improve safety management level from the perspective of behaviour management.

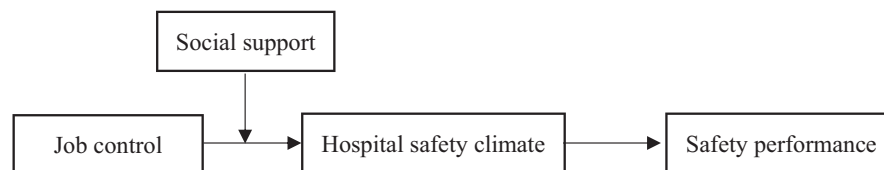
2 | LITERATURE REVIEW

2.1 | Job control and safety performance

Job control is defined as the extent to which employees perceive that they have autonomy over the timing and methods of their work. Job control is a very important factor contributing to workers' health, well-being and motivation (Rosen & Sascha, 2019). In the manufacturing context, there are some positive relationships between job control and occupational health (employees' health, well-being, motivation and performance) (Karasek, 1979; Rosen & Sascha, 2019; Turner et al., 2012). Safety performance is closely related to individual safety-related behaviour. While early safety performance refers to measurable results (e.g. workplace injuries, safety incidents) as indicators of safety failures, some research has focussed on the more proximal and positive safety-related outcomes, such as safety-related behaviours. There are two types of employee safety performance, which have been conceptualized, that is safety compliance and safety participation (Griffin & Neal, 2000).

Employee behaviour is directly influenced by individual psychological mechanisms, and according to self-determination theory, the satisfaction of basic psychological needs positively affects all types of job performance. Based on the Job Demands-Control-Support model, the researchers found some positive influence relationship between job control and employee safety performance (Karasek & Theorell, 1990; Turner et al., 2012). Besides, self-determination theory was used in the management of nurses and found that it can effectively improve nurses' enthusiasm and enhance their work status

FIGURE 1 Research model



and mental health status (Li et al., 2019). An empirical study by medical staff found that job control can directly affect hospital workers' safety performance (Lin et al., 2020).

2.2 | The mediating role of hospital safety climate

Organizational safety climate factors have an important role in influencing employee safety behaviour (Clarke, 2006). Safety climate is one type of climate (Zhoar, 2011) that can be experienced by individuals in organizations (Griffin & Neal, 2000). All types of climate are based on individuals' perceptions of the practices, procedures and rewards in the organization (Schneider, 1990). A simple Hospital Safety Climate Scale (HSCS) from the United States helps elucidate the relationships between safety climate, safe work practices and workplace exposure incidents (Gershon et al., 2000; Smith et al., 2011). When employees have autonomy over the timing and methods of their work, they can perceive easily a safety performance climate. As the most important concept of SDT, intrinsic motivation is a type of motivation based on people's natural interest in various activities that provide novelty and challenge (Deci & Ryan, 2010). Intrinsically motivated behaviours do not require external rewards; rather, they are an expression of a person's sense of who they are, of what interests them. According to SDT, the satisfaction of autonomy needs resulting from job control is the most important factor for stimulating strong and lasting intrinsic motivation (Deci & Ryan, 2008).

Firstly, employees' job control may affect hospital workers' perception of the safety climate. An independent study found that three types of job controls (process control, decision control and information control) perceived by employees were significantly positively related to employee organizational commitment and well-being, which contribute to a better hospital safety climate (Lee & Ravichandran, 2019). Employees' perception of management's safety commitment is affected by job control as the main dimension of safety climate (Pinion et al., 2017). Secondly, safety climate can be a good predictor of safety performance (Fugas et al., 2012; Jackson et al., 2010; Rosen et al., 2010; Smith et al., 2010; Smith et al., 2011). For example, safety climate was associated with subsequent changes in self-reported safety behaviour (Neal et al., 2000) and injuries and safety practices (Felknor et al., 2000). Finally, safety climate may play a mediating role in the influence mechanism of safety performance (Griffin & Neal, 2000; Lee & Ravichandran, 2019). Safety climate played a mediating role between safety culture and employee safety behaviour (Mei et al., 2017) and between ethical leadership and employee safety performance (Gao et al., 2017). Employee commitment as the main dimension of safety climate

played a mediating role between job control and job performance (Lee & Ravichandran, 2019). Besides, found work environments like safety climate mediated the relationship between safety management practices and safety performance including safety compliance and safety participation in the attitudes of nurses in the Jordanian hospitals (Ashour & Hassan, 2019).

2.3 | The moderating role of social support

Job control and the overall perceptions of safety climate may be affected by the employee social support by can buffer negative workplace factors (Salvador et al., 2020). Social support can reflect the emotional support (e.g. caring for and empathizing with someone), instrumental support (e.g. helping someone do their work) and structural support (e.g. the possibility that others can provide help) (Bowling et al., 2004). According to self-determination theory, social support from superiors and colleagues is the most important interpersonal connection in the workplace (Turner et al., 2012), especially in hospitals where colleague support helps to promote safe behaviours among hospital workers. Deal with the coronavirus disease (COVID-19), social support can reduce the spread of the virus from some evidence in China's hospitals. Turner et al. (2012) and Lin et al. (2020) examined the safety performance of hospital workers using the JDCS model and found, respectively, that social support played a moderating role between job demands and safety performance.

Besides, according to the above-mediating role of hospital safety climate between job control and safety performance, the moderating role of social support from hospital workers and social support may moderate the mediating role of hospital safety climate in the middle of job control and medical staff safety performance. When the social support from hospital workers is higher, the influence of job control on hospital safety climate may increase, which further improves their safety performance. When the social support from hospital workers is lower, the influence of job control on the hospital safety climate may decrease, which leads to the decrease in the perceived transmission of safety performance.

2.4 | Goal of the study

This paper aimed to explore the associations between individual psychological factors (i.e. job control, hospital safety climate and perceived social support) and safety outcomes (i.e. safety performance) for hospital workers. This paper hypothesized that social support from other physicians, nurses and hospital workers would

protect them from safety accidents while enhancing their safety compliance and safety participation facing the coronavirus disease. Our study hypotheses were as follows (Figure 1 Research model):

- Hypothesis 1. Job control will have a positive relationship with safety performance for hospital workers.
- Hypothesis 2. Hospital safety climate mediates the relationship between job control and safety performance for hospital workers.
 - a. Hypothesis 2a. Job control will have a positive relationship with hospital safety climate for hospital workers.
 - b. Hypothesis 2a. Hospital safety climate will have a positive relationship with safety performance for hospital workers.
- Hypothesis 3. Social support plays a moderating role in the relationship between job control and hospital safety climate for hospital workers.

3 | METHODS

3.1 | Participants and setting

In this study, we utilized the exploratory cross-sectional study method by using self-administered questionnaires (Jarrar et al., 2020) to test the research framework as Figure 1 shows. There are three hospitals agreed to participate in this study. With the agreement of the participants, all the questionnaires were sent to hospital workers and were collected at two points in time. In the first phase, we asked participants to complete a questionnaire comprising demographic variables, job control and hospital safety climate. In the second phase, participants who responded in the first phase were asked to complete social support and safety performance.

Before the participants answered the questionnaires, they first read and signed a consent form indicating that their participation was voluntary and guaranteeing the anonymity of their responses. Using convenience sampling, 300 questionnaires were distributed in the first phase, and 241 valid questionnaires were returned in the second phase (an effective response rate of 80.33%). The demographic profiling of the participants can be seen in Table 1. Participants were 241 hospital workers from 3 hospitals that have COVID-19 cases from Beijing and Shandong Province, in China (male = 55.2%, female = 44.8%; age range < 30 to > 45; physician = 58%, nurse = 22%, other hospital worker = 20%). The majority (36.5%) of the respondents had been in the hospital for a period of 3–5 years.

3.2 | Measuring instruments

All items use a 5-point Likert-type scale from 1 (none at all)–5 (a great deal) for measurement.

TABLE 1 Participants' socio-demographic characteristics

Characteristics	Participants (N = 241) (%)
Age (years old), N (%)	
≤25	13 (5%)
26–30	120 (50%)
31–35	61 (25%)
36–45	29 (12%)
46–55	16 (7%)
≥56	2 (1%)
Gender, N (%)	
Male	133 (55%)
Female	108 (45%)
Position, N (%)	
Physician	142 (58%)
Nurse	52 (22%)
Other hospital worker	47 (20%)
Years of working, N (%)	
≤1	32 (13%)
1–3	88 (37%)
3–5	63 (26%)
5–10	36 (15%)
≥10	22 (9%)

3.2.1 | Job control

We measured job control by using six items from Jackson et al. (1993), (example item: "To what extent do you plan your own work?"), with higher scores reflecting higher job control. Cronbach's α for the measure of job control was 0.846 in this survey.

3.2.2 | Hospital safety climate

A modified version of Zohar and Luria's (2005) organizational level safety climate scale was used (Fugas et al., 2012), with higher scores reflecting hospital safety climate. This 6-item survey consisted of a quantitative measure of employees' global perceptions about how safety is managed and addressed within their organization (example item: "Considers a person's safety behaviour when there are promotions.", "Listens carefully to workers' ideas about improving safety."). Cronbach's α for the measure of hospital safety climate was 0.836 in this survey.

3.2.3 | Social support

Social support was measured using a four-item scale from Haynes et al. (1999) (example item: "You can count on colleague backup at work"), with higher scores reflecting higher social support. Cronbach's α for the measure of social support was 0.922 in this survey.

3.2.4 | Safety performance

We measured safety performance by using six items of two dimensions (safety compliance and safety participation) from Griffin and Neal (2000) (example item: "I always carry out my work in a safe manner.", "I voluntarily carry out tasks or activities that help to improve safety"), with higher scores reflecting higher safety performance. Cronbach's α for the measure of social support was 0.924 in this survey.

3.2.5 | Controls

This study controlled socio-demographic differences, including gender, age and working time according to the previous studies that demographics have a significant relationship with safety outcomes (Pinion et al., 2017; Turner et al., 2005). Besides, hospital safety climate refers to all hospital workers, but different positions (physician, nurse and other hospital workers) may have different effect levels, such as nurse (Al-Bsheish et al., 2019; Jarrar et al., 2020). So, the position was controlled.

3.3 | Data analysis

3.3.1 | Discriminant validity

CFA was used to test the discriminant validity of four focal variables. Among them, the theoretical model proposed by the current study was viewed as the benchmark model. Besides, four alternative models were established by combining latent variables. The results are shown in Table 2 by Mplus software. From the results, it is clear that model 4 was the best, indicating that the discriminant validity of the four variables in this study was better.

3.3.2 | Descriptive statistics and correlation analysis

The mean values, standard deviations and correlations are presented in Table 3. There were significantly positive correlations among job control, social support, hospital safety climate and safety performance. These data provided prima facie evidence for subsequent analysis.

TABLE 2 CFA of the measurement model

Measurement model	χ^2	df	χ^2/df	RMSEA	CFI	TLI	SRMR
JC+SS+HSC+SP	1606.843	209	7.68	0.159	0.653	0.617	0.132
JC, SS+HSC+SP	1291.378	208	6.20	0.139	0.731	0.702	0.117
JC, SS, HSC+SP	750.612	206	3.64	0.097	0.865	0.849	0.060
JC, SS, HSC, SP	531.962	203	2.62	0.074	0.918	0.907	0.049

Note: The evaluation criteria: $\chi^2/df < 3$, RMSEA < 0.08 , CFI > 0.9 , TLI > 0.9 , SRMR < 0.08 , $N = 241$. Abbreviations: HSC, Hospital Safety Climate; JC, Job Control; SP, Safety Performance; SS, Social Support.

4 | RESULTS

4.1 | Job control influence on safety performance

Hypothesis 1 suggested that job control will have a positive relationship with safety performance for hospital workers. According to Model 5 in Table 4, the standardized regression coefficient of job control was 0.430 ($p < .001$), indicating that job control could significantly predict safety performance. Hence, hypothesis 1 was supported.

4.2 | The mediating role of hospital safety climate for safety performance

Model 2 in Table 4 reported that job control could significantly predict hospital safety climate ($\beta = 0.463$, $p < .001$), which supported hypothesis 2a. Model 6 in Table 4 reported that hospital safety climate could significantly predict safety performance ($\beta = 0.570$, $p < .001$), which supported hypothesis 2b. Besides, when the hospital safety climate was controlled at Model 6 in Table 4, job control could still significantly predict safety performance ($\beta = 0.167$, $p < .001$). But the mediating effect of hospital safety climate between job control and safety performance was partial. Hence, hypothesis 2 was supported.

4.3 | The moderating role of social support for safety performance

Model 3 in Table 4 reported that the interaction term was significant ($\beta = 0.110$, $p < .001$), demonstrating that job control for hospital workers could positively moderate the positive impact of hospital safety climate. Specifically, the higher the level of social support for hospital workers, the stronger the positive impact of job control on hospital safety climate. Hypothesis 3 was initially supported. To more clearly show the moderation effect of social support for hospital workers, the moderation effect diagram was plotted as shown in Figure 2.

The results of the "Bootstrap" test of the moderating mediating effect, using the PROCESS plug-in in SPSS 26.0, showed that: index = 0.0723, Boot standard error was 0.0316, with a confidence interval of [0.0145, 0.1404] at the 95% level, and did not contain "0", indicating that social support moderates the mediating role of hospital

TABLE 3 Mean values, standard deviations and correlations

Variables	M	SD	1	2	3	4	5	6	7	8
1. Gender	0.55	0.498	1							
2. Age	2.71	1.14	0.195**	1						
3. Position	1.98	0.642	-0.081*	-0.088	1					
4. Working time	5.7	1.15	0.078	0.451**	-0.104	1				
5. Job control	3.89	0.766	0.094	0.185**	0.042	-0.028	1			
6. Hospital safety climate	3.63	0.757	0.090	-0.042	0.031	0.012	0.461**	1		
7. Social support	3.80	0.842	0.037	-0.116	0.073	0.015	0.357**	0.722**	1	
8. Safety performance	3.68	0.934	-0.043	-0.095	0.048	-0.023	0.423**	0.638**	0.752**	1

Note: N = 241.

Abbreviation: SD, standard deviation.

* $p < .05$,

** $p < .01$.

Variables	Hospital safety climate			Safety performance		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Gender	0.105	0.041	0.035	-0.022	-0.082	-0.105*
Age	-0.079	0.033	0.067	-1.00	0.004	-0.014
Position	0.037	0.019	-0.023	0.040	0.023	0.013
Working time	0.044	0.009	-0.019	0.028	-0.004	-0.009
JC		0.463***	0.232***		0.430***	0.167**
HSC						0.570***
SS			0.671***			
JC \times SS for SP			0.110*			
R ²	0.015	0.216	0.588	0.012	0.186	0.440
Adjust R ²	-0.002	0.200	0.576	-0.005	0.169	0.426
F	0.868	12.964***	47.515***	0.698	10.743**	30.681***

Note: N = 241. The coefficients are standardized coefficients.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

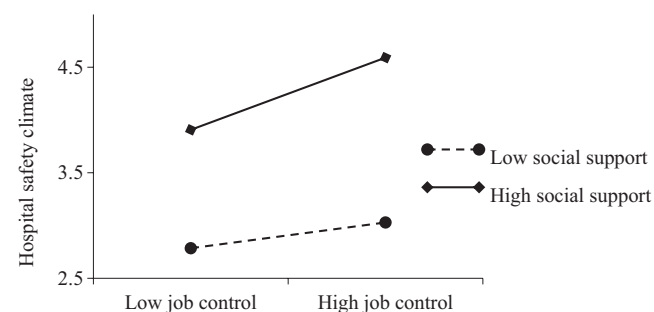


FIGURE 2 The moderation effect of social support for hospital workers

safety climate between job control and safety performance, i.e. the higher the level of social support, the stronger the mediating role of hospital safety climate. Further regression analysis indicated that when

TABLE 4 Regression analysis results

the average of social support for hospital workers was subtracted by a standard deviation, the effect of hospital safety climate was 0.1035 and the confidence interval was [0.0016, 0.1989], not including “zero”. When the average of social support for hospital workers was added by a standard deviation, the effect of hospital safety climate was 0.2120 and the confidence interval was [0.1227, 0.3039], not including “zero”.

5 | DISCUSSION

With regard to the link between job control, safety performance and the roles of the hospital safety climate and social support, this section is the core of the paper, which intends to discuss and analyse the whole empirical model developed to guide this study. Little research from SDT has been conducted examining that relationship in hospital settings.

As presented in Table 4, the findings indicate a positive relation between job control with the safety performance of hospital workers in China. The results of the hypothesis 1 are consistent with earlier studies (Karasek, 1979; Lin et al., 2020; Rosen & Sascha, 2019; Turner et al., 2012). It is also in the line of self-determination theory (Li et al., 2019) in the management of nurses. Most of our knowledge about safety climate comes from the manufacturing and heavy industry work settings. The new idea presented in this paper is specifically focussing on hospital safety climate between job control and safety performance. Hospital safety climate refers to the summary of perceptions that hospital workers share about the safety of their work environment. Other findings revealed a significant and positive relation between hospital safety climate on safety performance. The results of the hypothesis 2.2 are consistent with other health care studies (Gershon et al., 2000; Smith et al., 2010; Smith et al., 2011), that is hospital safety climate has a positive relation to safety performance. According to self-determination theory, the summary perceptions of hospital safety climate are likely to be stimulated by job control (Lee & Ravichandran, 2019; Pinion et al., 2017). In conclusion, these findings confirmed most previous works found the mediating role of safety climate or the relevant variables such as perceived management commitment to safety and work environment (Al-Bsheish et al., 2019; Ashour & Hassan, 2019; Gao et al., 2017; Lee & Ravichandran, 2019; Mei et al., 2017).

Further important findings revealed a significant and positive relationship of social support between job control and hospital safety climate. In other words, hospital workers who have the higher level of social support could perceive more hospital safety climate. Although previous safety researchers recognized the significant role of social support in enhancing safety performance (Bowling et al., 2004; Lin et al., 2020; Turner et al., 2012). But for individuals, they need to depend on themselves firstly and then on social support from other colleagues. That means social support is an indirect factor influencing an individual's safety performance through their hospital safety climate.

5.1 | Practical implications

The results of the study have some guiding value for improving the safety performance of hospital workers. Firstly, the study found that job control for hospital workers had a significant positive effect on safety performance. The core of the management approach based on the implementation of self-determination theory is to involve medical staff in safety decisions and to stimulate their intrinsic motivation. Hospital managers should pay attention to job control for hospital workers to motivate them to participate in safety management. Secondly, job control can enhance the positive impact on safety performance through the hospital safety climate. Hence, surveys about hospital safety climate should be actively conducted to enhance workplace management and standard protective configurations to improve the level of hospital safety climate. For example, strengthening the level of commitment to safety by hospital

management (Al-Bsheish et al., 2019; Vredenburg, 2002), including management commitment, rewards, communication and feedback, selection, training and participation. Finally, the study found that social support plays an important role in the relationship between job control and safety performance.

5.2 | Study limitations

Although this paper extends the existing hospital safety performance literature by the research framework as Figure 1 shows, it has some limitations such as utilizing the self-administered questionnaires. Hence, it is difficult to explore causal relationships by the nature of the study design. Because the collection of data was limited to China hospital settings and self-questionnaires, the generalization of study findings is a difficulty. Besides, the designs above do not make a distinction between safety compliance and safety participation.

5.3 | Future studies

Future studies can focus on the following aspects: first, further expand the study sample and pay attention to distinguish the differences between physicians, nurses and other hospital workers, and use objective data such as readmission rate and infection rate instead of hospital safety performance as much as possible. Secondly, because the concept and measurement dimensions of hospital safety climate affected by cross-culture (Smith et al., 2011) have not been agreed upon (Beus et al., 2019), the future needs to develop a specific hospital safety climate scale based on Chinese culture and hospital characteristics. Third, the boundary conditions can be further broadened based on different theories or different research perspectives, to provide richer theoretical and empirical research results for hospital safety management.

6 | CONCLUSION

This paper was motivated to explore the associations between individual psychological factors (i.e. job control, hospital safety climate and perceived social support) and safety outcomes (i.e. safety performance) for hospital workers, as many evidences show the importance to explore these relationships. A mediating model with moderating effects on the relationship between job control for hospital workers and safety performance was constructed from the perspective of hospital workers' behaviour based on self-determination theory. Among them, job control for hospital workers has a significant positive influence on safety performance; hospital safety climate mediates the relationship between job control for hospital workers and safety performance; social support moderates the relationship between job control and hospital safety climate. Hence, the mediating role of hospital safety climate was further enhanced when

the level of social support for medical staff was increased. The findings of this work might be useful for academics and hospital administrators to strengthen safety performance among their employees by providing insights for policy-makers.

AUTHOR CONTRIBUTIONS

G.L.Z. involved in writing the manuscript, conception and design, acquisition of data, analysis and interpretation of data and drafting the manuscript. C.X.Y. involved in critical revision of the manuscript and guarantor of integrity of the entire study.

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE (<http://www.icmje.org/recommendations/>)]:

- substantial contributions to conception and design, acquisition of data or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

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CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

DATA AVAILABILITY STATEMENT

Because participants of this study were told that their data would not be shared publicly, supporting data are not available.

ETHICAL APPROVAL

This study was reviewed by specialists from Beijing Children's Hospital Ethics Committee. All the participants were volunteers and completed informed consent after explaining the research purpose. Participation was purely voluntary, and there was no conflict of interest between the researchers and the participants.

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REFERENCES

- Al-Bsheish, M., Jarrar, M. T., & Scarbrough, A. (2021). Public safety compliance model of safety behaviors in the age of the COVID-19 pandemic. *Inquiry: The Journal of Health Care Organization, Provision, and Financing*, 58, 1–6.
- Al-Bsheish, M., bin Mustafa, M., Ismail, M., Meri, A., & Dauwed, M. (2019). Perceived management commitment and psychological empowerment: A study of intensive care unit nurses' safety. *Safety Science*, 118, 632–640.
- Ashour, A., & Hassan, Z. (2019). The role of the work environment on the safety performance and safety management practices: Its influence on the attitudes of nurses in the Jordanian hospitals. *American Journal of Applied Sciences*, 16(11), 314–326.
- Beus, J. M., Payne, S. C., Arthur, W., & Muñoz, G. J. (2019). The development and validation of a cross-industry safety climate measure: Resolving conceptual and operational issues. *Journal of Management*, 45(5), 1987–2013.
- Bowling, N. A., Beehr, T. A., Johnson, A. L., Semmer, N. K., Hendricks, E. A., & Webster, H. A. (2004). Explaining potential antecedents of workplace social support: Reciprocity or attractiveness? *Journal of Occupational Health Psychology*, 9(4), 339–350.
- Clarke, S. (2006). The relationship between safety climate and safety performance: A meta-analytic review. *Journal of Occupational Health Psychology*, 11(4), 315–327.
- Deci, E. L., & Ryan, R. M. (2008). Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology*, 49, 14–23.
- Deci, E. L., & Ryan, R. M. (2010). Intrinsic motivation. *The Corsini Encyclopedia of Psychology*, 1, 1–2.
- DeJoy, D. M., Searcy, C. A., Murphy, L. R., & Gershon, R. R. M. (2000). Behavioral-diagnostic analysis of compliance with universal precautions among nurses. *Journal of Occupational Health Psychology*, 5, 127–141.
- Felknor, S. A., Aday, L. A., Burau, K. D., Delclos, G. L., & Kapadia, A. S. (2000). Safety climate and its association with injuries and safety practices in public hospitals in Costa Rica[J]. *International Journal of Occupational and Environmental Health*, 6(1), 18–25.
- Fugas, C. S., Silva, S. A., & Meliá, J. L. (2012). Another look at safety climate and safety behavior: Deepening the cognitive and social mediator mechanisms. *Accident Analysis and Prevention*, 45, 468–477.
- Gao, W., Cao, Q., & Xu, Z. (2017). The impact of ethical leadership on employee safety performance: The cross-level mediating effect of safety climate and psychological capital. *Management Review*, 11(29), 116–128.
- Gershon, R. R., Karkashian, C. D., Grosch, J. W., Murphy, L. R., Escamilla-Cejudo, A., Flanagan, P. A., & Martin, L. (2000). Hospital safety climate and its relationship with safe work practices and workplace exposure incidents. *American Journal of Infection Control*, 28, 211–221.
- Griffin, M. A., & Neal, L. (2000). Perceptions of safety at work: A framework for linking safety climate to safety performance, knowledge, and motivation[J]. *Journal of Occupational Health Psychology*, 5(3), 347–358.
- Häusser, J. A., Mojzisch, A., Niesel, M., & Schulz-Hardt, S. (2010). Ten years on: A review of recent research on the job demand–control (–support) model and psychological well-being. *Work and Stress*, 24(1), 1–35.
- Haynes, C. E., Wall, T. D., Bolden, R. I., Stride, C., & Rick, J. E. (1999). Measures of perceived work characteristics for health services research: Test of a measurement model and normative data. *British Journal of Health Psychology*, 4(3), 257–275.
- Hofmann, D. A., Morgeson, F. P., & Gerras, S. J. (2003). Climate as a moderator of the relationship between leader–member exchange and content specific citizenship: Safety climate as an exemplar. *Journal of Applied Psychology*, 88, 170–178.
- Jackson, J., Sarac, C., & Flin, R. (2010). Hospital safety climate surveys: Measurement issues. *Current Opinion in Critical Care*, 16(6), 632–638.
- Jackson, P. R., Wall, T. D., Martin, R., & Davids, K. (1993). New measures of job control, cognitive demand, and production responsibility. *Journal of Applied Psychology*, 78(5), 753–762.
- Jarrar, M. T., Al-Bsheish, M., Dardas, L. A., Meri, A., & Sobri Minai, M. (2020). Adverse events in Malaysia: Associations with nurse's ethnicity and experience, hospital size, accreditation, and teaching status. *The International Journal of Health Planning and Management*, 35(1), 104–119.
- Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24(2), 285–308.

- Karasek, R. A., & Theorell, T. (1990). *Healthy work: Stress, productivity, and the reconstruction of working life*. Basic Books.
- Lee, S. A., & Ravichandran, S. (2019). Impact of employees' job control perceptions on their work-related responses in the hospitality industry. *International Journal of Contemporary Hospitality Management*, 31(7), 2720–2738.
- Li, J., Dai, Y., & Su, X. (2019). Management of nurses working in a hospital unit based on self-determination theory. *Journal of Nursing Science*, 34(11), 43–46.
- Lin, X., Zhao, G., & Yang, E. (2020). Safety and security behavior performance of the hospital workers based on the JDCS model. *Journal of Safety and Environment*, 20(6), 2232–2238.
- Mei, Q., Zhang, C., Li, W., & Liu, S. (2017). Relationship among safety culture, safety climate and staffs' safety behavior- an empirical analysis of SMEs in high-risk industry. *Journal of Systems & Management*, 26(2), 277–286.
- Neal, A., & Griffin, M. A. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels. *Journal of Applied Psychology*, 91, 946–953.
- Neal, A., Griffin, M. A., & Hart, P. M. (2000). The impact of organizational climate on safety climate and individual behavior[J]. *Safety Science*, 34(1), 99–109.
- Pinion, C., Brewer, S., Doupbrate, D., Whitehead, L., DelliFraine, J., Taylor, W. C., & Klyza, J. (2017). The impact of job control on employee perception of management commitment to safety. *Safety Science*, 93(1), 70–75.
- Rosen, A. K., Singer, S., Zhao, S., Shokeen, P., Meterko, M., & Gaba, D. (2010). Hospital safety climate and safety outcomes: Is there a relationship in the VA? *Medical Care Research and Review*, 67(5), 590–608.
- Rosen, P. H., & Sascha, W. (2019). Scoping review on job control and occupational health in the manufacturing context. *The International Journal of Advanced Manufacturing Technology*, 102, 2285–2296.
- Salvador, J. T., Alqahtani, F. M., Al-Madani, M. M., Jarrar, M. K., Dorgham, S. R., Victoria Reyes, L. D., & Alzaid, M. (2020). Workplace violence among registered nurses in Saudi Arabia: A qualitative study. *Nursing Open*, 8(2), 1–10.
- Schneider, B. (1990). The climate for service: An application of the climate construct. In B. Schneider (Ed.), *Organizational climate and culture* (pp. 383–412). Jossey-Bass.
- Smith, D. R., Muto, T., Sairenchi, T., Ishikawa, Y., Sayama, S., Yoshida, A., Townley-Jones, M., & Shizue Sayama, A. Y. A. M. (2010). Hospital safety climate, psychosocial risk factors and needlestick injuries in Japan. *Industrial Health*, 48, 85–95.
- Smith, D. R., Muto, T., Sairenchi, T., Ishikawa, Y., Sayama, S., Yoshida, A., & Townley-Jones, M. (2011). Examining the dimensions of hospital safety climate and psychosocial risk factors among Japanese nurses. *Journal of Transcultural Nursing*, 22(3), 257–264.
- Snyder, L. A., Krauss, A. D., Chen, P. Y., Finlinson, S., & Huang, Y. (2008). Occupational safety: Application of the job demand-control-support model. *Accident Analysis & Prevention*, 40(5), 1713–1723.
- Turner, N., Chmiel, N., & Walls, M. (2005). Railing for safety: Job demands, job control, and safety citizenship role definition. *Journal of Occupational Health Psychology*, 10, 504–512.
- Turner, N., Stride, C. B., Carter, A. J., McCaughy, D., & Carroll, A. E. (2012). Job demands-control-support model and employee safety performance. *Accident Analysis and Prevention*, 45, 811–817.
- van der Doef, M., & Maes, S. (1998). The job demand-control(-support) model and physical health outcomes: A review of the strain and buffer hypotheses. *Psychological Health*, 13(5), 909–936.
- Vredenburg, A. G. (2002). Organizational safety: Which management practices are most effective in reducing employee injury rates? *Journal of Safety Research*, 33(2), 259–276.
- Zhao, N., Wang, G., Li, G., Lang, J., & Zhang, H. (2020). Air pollution episodes during the COVID-19 outbreak in the Beijing-Tianjin-Hebei region of China: An insight into the transport pathways and source distribution. *Environmental Pollution*, 267, 115617.
- Zhoar, D. (2011). Safety climate: Conceptual and measurement issues. In J. C. Quick & L. E. Tetrick (Eds.), *Handbook of occupational Health Psychology* (2nd ed.). American Psychological Association.
- Zohar, D., & Luria, G. (2005). A multilevel model of safety climate: Cross-level relationships between organization and group-level climates. *Journal of Applied Psychology*, 90(4), 616–628.

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