The type of involuntary overtime and emotional exhaustion among Chinese medical staff: The mediating role of job stress and moderated mediation role of desire for control in Machiavellian leadership

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ABSTRACT

Purpose: With the development of China's economy, China's medical level is also rising. Medical staff is constantly working overtime due to heavy workload, which can lead to emotional exhaustion in the long run. Therefore, it is necessary to reduce the level of emotional exhaustion of Chinese medical staff. Based on this question, this study used involuntary overtime (conformity/workload) of medical staff working in Chinese medical institutions as an independent variable, trying to explore which variables increased the level of emotional exhaustion of medical staff.

Design/Methodology/Approach: This study also investigated the mediating effect of job stress and the moderated mediating role of the desire for control in Machiavellian leadership. To investigate these questions, this study surveyed 313 medical personnel working in Chinese medical institutions.

Findings: The results showed that involuntary overtime (conformity/workload) had a positive effect on job stress. work stress had no significant effect on emotional exhaustion. Job stress has a positive effect on emotional exhaustion of Chinese medical staff.

Conclusion: This study aimed to identify which variables increase the level of emotional exhaustion in healthcare workers and suggested how to reduce emotional exhaustion in health care workers based on the findings.

Research Limitations/Implications: We conducted a cross-sectional study. In future research, to further clarify these results, longitudinal studies should be conducted around the time gap.

Practical Implications: Due to the unique nature of medical work, medical staff generally have unhealthy living habits. The organization should therefore reasonably arrange overtime for medical staff and appropriately allocate their workload. Additionally, Organizations should focus on the work-family situation of medical staff, improve their work enthusiasm, and reduce the occurrence of job stress.

Contribution to Literature: This research expends the research field of overtime work types and emotional exhaustion.

Keywords: *Chinese medical staff, Desire for control in Machiavellian leadership, Emotional exhaustion, Involuntary overtime, Job stress.*

1. INTRODUCTION

Chinese medical institutions possess professional abilities such as diagnosis and treatment, surgery, higher-level professional ethics, humanistic qualities, empathy ability, and doctor-patient communication ability (Jin & Zheng, 2022). Medical staff have the closest contact with patients and are responsible for addressing their diverse needs (Zhao & Chen, 2021). Workload and patient relationships significantly affect the well-being of medical staff. Those in direct clinical contact with infected patients are more likely to experience high levels of depression and anxiety (Liu et al., 2020). Mental stress, workload, and frequent overtime lead to higher rates of depression and anxiety among medical staff, triggering emotional exhaustion (Ma et al., 2022). Recently, emotional exhaustion has become a pressing issue among medical professionals (Liu, Mu, Cui, & Gu, 2020), highlighting the need to

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understand the underlying reasons for the high emotional exhaustion in members engaged in Chinese medical institutions. Emotional exhaustion is a subordinate dimension of job burnout, which means that people feel that their emotional resources have been depleted due to excessive psychological burdens or demands (Choi & Lee, 2012). Symptoms of emotional exhaustion include an inability to judge work accurately, lack of motivation, and indifference to each other, resulting in a decline in the quality of customer service and adverse effects on organizational performance (Koo & Cho, 2008). Prolonged emotional exhaustion can lead to long-term physical and psychological health problems among organizational members (Lambert, Hogan, & Altheimer, 2010).

The fewer working hours per day, the lower the level of emotional exhaustion (Zhang, Liu, & Zhu, 2020). That is, overtime has a positive effect on emotional exhaustion. As members of special jobs, medical staff is often forced to work overtime due to heavy workload, and their physical strength and time may not be enough to cope with these overloaded duties, which can reduce work engagement and cause emotional exhaustion (Xiong, Huang, & Chen, 2022). Long periods of involuntary overtime can negatively impact employees, resulting in lower perceptions of task performance, and may lead to emotional exhaustion (Li, Cui, & Xue, 2020).

For Chinese medical institutions, when the level of emotional exhaustion is high, job engagement may decrease and negatively impact the organization (Huang et al., 2012). On the contrary, when the level of emotional exhaustion is low, medical staff will enhance work autonomy, improve the sense of organizational justice, enhance individual-organization cooperation, and increase social support from the organization, leaders, colleagues, and patients (Fang & Chen, 2008).

Therefore, the purpose of this study is as follows: Firstly, we hope to shed light on the relative lack of research involving emotional exhaustion in medical staff by reviewing previous research. Here, our goal is to confirm the relationship between involuntary overtime and the emotional exhaustion of medical staff. Furthermore, this study analyzes the role of involuntary overtime in emotional exhaustion and explores how involuntary overtime increases the emotional exhaustion of healthcare workers.

Secondly, while most studies have focused on exploring the independent variables that affect emotional exhaustion and verifying the mediators that affect emotional exhaustion or the moderator variables that moderate emotional exhaustion levels, this study expands the scope of research on emotional exhaustion simultaneously validating both the mediating and moderating effects. Furthermore, this study proposes and validates a pattern of the mediating effects of moderation.

Thirdly, like other studies, we explore the mediating effect of job stress; however, in this study, we also confirm and validate the moderating effect of the Machiavellian desire for control in leadership. Specifically, we examine the impact of involuntary overtime and emotional exhaustion and confirm how the level of emotional exhaustion changes through the interaction between involuntary overtime and the leadership's Machiavellian desire for control. This finding highlights the role of the leadership style in regulating the mediating effect of job stress.

Overall, this study aims to explore the variables that increase the level of emotional exhaustion among healthcare workers and to demonstrate the significance of this model. In addition, this study also expands the scope of research on emotional exhaustion among medical staff and provides a theoretical basis for future research studies. Therefore, this study contributes to the scope of research on emotional exhaustion in the healthcare setting.

2. THEORETICAL BACKGROUND AND HYPOTHESES

2.1. Involuntary Overtime (Conformity/Workload)

Long hours worked beyond one's regular schedule are often referred to as overtime, with a distinction made between involuntary and voluntary overtime. Forced or involuntary overtime is a more covert way of pressuring or coercing employees to work beyond their promised hours (Hetty van Emmerik & Sanders, 2005). Workers who face negative consequences for refusing to work additional hours are considered to face mandatory overtime (Golden & Wiens-Tuers, 2005). Involuntary overtime can leave employees feeling helpless and resentful (Babbar & Aspelin, 1998) and may lead to physical and mental stress if it occurs in a demanding work environment (Jaehyup, Jun, & Chunghun, 2019). Involuntary overtime means that companies can require their employees to work more than 40 hours (Feldman, 2002). Thus, involuntary overtime can damage health and lead to chronic health problems due to fatigue accumulation without sufficient recovery time (Houdmont, Zhou, & Hassard, 2011). These extra work commitments can be costly if employees feel inexplicably and unexpectedly pressured to work overtime. It can also have detrimental effects on family life (Patrick & Lavery, 2007). Furthermore, it is believed that involuntary overtime has a negative impact on employees' work attitudes (Hojoong, Eun-Suk, & Shinhyung, 2019).

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Involuntary overtime was found to have a positive effect on work-family conflict (Yu & Leka, 2022). However, Beckers et al. (2008) found that involuntary overtime has a negative effect on employee satisfaction. Peterson et al. (2019) found that it has a positive effect on emotional exhaustion, while Ma, (2022) found that it has a negative effect on mental health.
Therefore, involuntary overtime in this study refers to mandatory overtime that occurs due to organizational regulations or large workloads and is used as a negative variable.

2.2. Job Stress
Stress refers to the stereotype response itself that is superimposed on all specific effects of stress (Selye, 1946). However, job stress can be regarded as a state or a characteristic (Sager, 1994) and refers to the negative subjective experience and psychological and physiological responses of individuals to adverse stimuli related to work (Ling, Fang, & Huang, 2004). By definition, stress creates a situation of extreme discomfort and a detrimental work environment for most employees (Gupta & Beehr, 1979). Job stress often disrupts an individual's psychological and physiological homeostasis, forcing them to disengage from functioning normally in their interactions with work and the work environment (Jamal, 1990).
Job stress can be conceptualized as an individual's response to the characteristics of the work environment that poses an emotional and physical threat to the individual (Jamal, 2005). Stress is defined as the relationship between a person and the environment. Thus, if the job demands exceed a person's ability to respond, or if that person's abilities exceed job demands, the resulting inconsistency creates stress (Blau, 1981). Surveys show that members are stressed at work. Stress not only leads to lower productivity but also decrease job performance and may even prompt employees to make a logical decision to quit (Choi, 2018).
Job stress has a positive effect on job burnout (Song & Park, 2007) and is negatively related to self-resilience, social support, and job satisfaction (Chung & Lee, 2011). A study of airline cabin crew found that job instability had a positive effect on job stress (Lee, Choi, Jeong, & Park, 2021), while other research has shown a positive correlation between turnover intention and job stress (Kim, 2021).
For this study, work stress refers to stress generated by work that evokes both psychological and physiological responses. Work pressure caused by continual overtime work not only affects the mental health of medical staff but also exhausts the body, and can even threaten the lives of the patients.

2.3. The Desire for Control in Machiavellian Leadership
The desire for control is a personality trait that reflects the extent to which individuals are motivated to control their life events (Burger & Cooper, 1979). Machiavellians are good at controlling others and have a strong desire to occupy a high position in the workplace (Qin & XU, 2013). Machiavellians display unique emotional and behavioral responses in situations where they experience a loss of control (Yuan & Men, 2020). Moreover, leaders with a high desire for control sometimes sacrifice members' interests to satisfy their desires and engage in unethical behaviors (Greenbaum, Hill, Mawritz, & Quade, 2017). In addition, the desire for control refers to the achievement and satisfaction of individuals by changing the world to meet their own needs (Yuan & Men, 2020). The Machiavellian leadership style affects members through a strong desire for control (Genau, Blickle, Schütte, & Meurs, 2022).
Surveys have shown that the desire for control has a negative impact on openness (Zhang, 2020). Furthermore, a survey conducted by Bekiari, (2017) found that teachers' verbal aggression has a positive effect on the desire for control. Additionally, Machiavellian control has been found to have a positive effect on unethical consumer behavior (Chowdhury, 2020). The desire for control has also been shown to have a negative effect on candor and humility (friendliness aspect) (DeShong, Helle, Lengel, Meyer, & Mullins-Sweatt, 2017).
Therefore, based on prior research, this study defines the Machiavellian desire for control as the boss's leadership and domination in interpersonal relationships, including the possession of members. While all Machiavellian aspects represent themes of self-interest, immoral manipulation and a desire for control are arguably the most selfish aspects of the Machiavellian personality (Burger & Cooper, 1979).
Therefore, this study selects the desire for control in Machiavellian leadership as a negative variable.

2.4. Emotional Exhaustion
Emotional exhaustion refers to the feeling that one's emotional and physical resources are overstretched and depleted (Christina Maslach, Schaufeli, & Leiter, 2001). It is physical, emotional, and mental exhaustion that occurs

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because professionals are chronically unable to withstand stress (Koo & Cho, 2008). Emotional exhaustion is the result of long-term emotional tension that leads individuals to feel that their mental and physical energy is depleted, their emotional resources are exhausted, and physical and psychological symptoms such as negative frustration and lack of self-confidence appear (Du & Li, 2020). It is a form of extreme work-related stress in which organizational members who experience this stress lose interest, trust, enthusiasm and develop feelings of fatigue and loss (Choi & Lee, 2012). When employees are emotionally exhausted due to stress, it can reduce work engagement and job performance, thereby increasing turnover (Qian, Ding, & Jiang, 2015). Emotional exhaustion refers to an individual's state of exhaustion in the face of adverse working conditions, leading to the depletion and exhaustion of emotional and psychological resources (Zhao & Chen, 2021). Long-term emotional exhaustion can cause physical and psychological harm, leading to health problems (Lambert et al., 2010). Moreover, when members are in a state of emotional exhaustion, they may engage in knowledge hiding behaviors (Yang, Gao, Ji, & Xie, 2021).

Emotional exhaustion has negative effects on both dimensions of subjective well-being: cognitive and emotional (Lee & Han, 2016). According to a survey, surface behavior has a positive effect on emotional exhaustion (Jang, Tak, & Lee, 2017). On the other hand, it has been demonstrated that organizational justice has a negative effect on emotional exhaustion (Cho & Kwon, 2015). Similarly, employees' role stress has a positive effect on emotional exhaustion (Du & Li, 2020).

In this study, emotional exhaustion refers to a long-term fatigue state under unfavorable conditions, in which physical and mental energy and emotional resources are exhausted. Therefore, this study treats emotional exhaustion as a negative variable, commonly known as burnout.

2.5. Involuntary Overtime (Conformity/Workload) and Job Stress

Often working overtime without overtime pay makes employees work feel unhappy and stressed, as reported by Kawaguchi and Kasai (2016). When companies fail to help employees balance work and family responsibilities, those who are forced to work long hours of overtime experience work stress (Berg, Kalleberg, & Appelbaum, 2003). Members who work long hours need sufficient time to recover, but may not have enough time to relax after finishing work, leading to job stress (Kikuchi et al., 2020). In addition, prolonged overtime due to workload may lead to sleep deprivation, which can increase or decrease anxiety and depression, thereby triggering job stress (Nishitani, Sakakibara, & Akiyama, 2013).

Therefore, involuntary overtime (conformity/workload) is a negative element that creates job stress.

Hypothesis 1-1. Involuntary overtime (conformity) induces job stress in the worker.

Hypothesis 1-2. Involuntary overtime (workload) also induces job stress.

2.6. Involuntary Overtime (Conformity/Workload) and Emotional Exhaustion

Devotion to work can lead to physical and psychological resource depletion, and the longer the overtime, the greater the loss of these resources, ultimately leading to emotional exhaustion (Li et al., 2020). Nurses who are forced to work long-term involuntary overtime experience physical fatigue and emotional exhaustion (Garrett, 2008). Employees who are required to work overtime involuntarily often experience a lack of sleep, which can lead to emotional hunger and even affect their health (Neitzel, 2021). Preliminary research has shown that when employees work overtime for a long time, there is always work-family conflict and family stress, which leads to emotional exhaustion if sustained over an extended period (Santa Maria et al., 2018).

Based on these theories, we set the following assumptions.

Hypothesis 2-1. Involuntary overtime(conformity) will have a negative impact on emotional exhaustion.

Hypothesis 2-2. Involuntary overtime(workload) will have a negative impact on emotional exhaustion.

2.7. Job Stress and Emotional Exhaustion

High levels of job stress among medical staff can reduce psychological resilience and increase the level of emotional exhaustion (Xu & Deng, 2019). The responsibilities of medical staff may cause stress in many ways, and long-term exposure to work pressure that exceeds the psychological level of medical staff will reduce job autonomy and may lead to emotional exhaustion (Liu, Zhang, Wang, Wang, & Zhao, 2021). Job stress reduces psychological resources, thereby affecting an individual's perception of resource access signals. In other words, depending on one's situation, there are fewer and fewer relevant resources to complete a job, and emotional

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exhaustion occurs when an individual realizes that the resources needed to perform a task cannot be obtained (Zhou, Gu, & Peng, 2020). Moreover, for employees with a heavy workload, role conflict or excessive burden will lead to job stress, causing members to have a series of adverse psychological and/or physiological reactions, and further produce emotional exhaustion (Lv & Ling, 2014).
Therefore, job stress is an element that facilitates emotional exhaustion.
Hypothesis 3. Job stress is a direct cause of emotional exhaustion.

2.8. The Mediating Effect of Job Stress
Involuntary overtime interprets the perceived work pressure of workers as excessive exploitation of oneself. When this occurs, if the motivation is coercive rather than voluntary, then the sense of belonging and emotional dependence on the organization will be lost, which will lead to emotional negativity and emotional exhaustion (Li et al., 2020). When employees work involuntary overtime they perceive a high level of control and deprivation; their actions are restricted, their self-discipline cannot be exerted, a high level of job stress is generated, and they respond negatively to work, resulting in emotional exhaustion (Wang, Jing, & Sun, 2021). Moreover, medical staff, as members of special organizations, are often forced to work overtime in emergencies. This vicious cycle of stress can lead to emotional exhaustion (En-Chi et al., 2013). Medical staff whose stress is related to overtime, job tension, increased workload, family burden, etc. (Jin, 2008) may lose high-intensity work pressure goals, and even feel lonely, which can lead to intense emotional exhaustion in severe cases (Zeng & Shi, 2008).
Based on these arguments, the following hypotheses are proposed:
Hypothesis 4-1. Job stress impacts the relationship between Involuntary overtime (conformity) and emotional exhaustion.
Hypothesis 4-2. Job stress impacts the relationship between Involuntary overtime (workload) and emotional exhaustion.

2.9. The Moderated Mediation Effects of Desire for Control in Machiavellian Leadership
This study highlights that the desire for control in Machiavellian leadership is one of the effects of increased involuntary overtime in job stress. Thus, job stress is determined by the interaction between involuntary overtime and the leadership's Machiavellian desire for control.
When leaders have a strong desire to dominate and control, they usually use the banner of "care" to manipulate those around them (Ma, 2018). Therefore, Machiavellian leaders with high control desire will assign large workloads and increase overtime to employees, causing more work stress (Hammali & Nastiezaie, 2022). High-controlling leaders tend to manipulate members and force them to do anything for a purpose, thereby creating job stress that increases the negative consequences for the organization in the long run. Therefore, involuntary overtime plays an important role in increasing work stress levels.
Likewise, when employees detect a high level of control in their leaders, levels of work stress increase. Cognitive psychology theory points out that the influence of external forces on human behavior is not through the "stimulus-response" process emphasized by behaviorist psychologists but through the process of human self-cognition processing (Wang & Zhang, 2016).
Long-term forced overtime by employees enhances members' sense of psychological resistance, increases the psychological burden, and causes emotional exhaustion. Therefore, this study argues that Machiavellian leadership domination desires moderate the effect between involuntary overtime and job stress. Furthermore, according to the self-loss theory, individuals are an important cause of self-control and self-management failures when they self-control energy or resource loss (Wang, Yuan, & Long, 2013).
This study selected job stress as a mediating variable between involuntary overtime and emotional exhaustion. Furthermore, the leader's Machiavellian desire for control has been identified as a moderator of the relationship between involuntary overtime and job stress.
Therefore, this study emphasizes the mediating role of the boss's Machiavellian desire for control over work stress. This theory sets the final hypotheses of this study.
Hypothesis 5-1. The desire for control in Machiavellian leadership will have a negative moderating effect on the relationship between involuntary overtime(conformity) and job stress.
Hypothesis 5-2. The desire for control in Machiavellian leadership has a negative moderating effect on the relationship between Involuntary overtime (workload) and job stress.

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Hypothesis 6-1. The mediating influence of job stress on the relationship between Involuntary overtime(conformity) and emotional exhaustion is moderated by the desire for control in Machiavellian leadership.
Hypothesis 6-2. The mediating influence of job stress on the relationship between Involuntary overtime(workload) and emotional exhaustion is moderated by the desire for control in Machiavellian leadership.

3. METHODS

3.1. Sample Characteristics

This study conducted an empirical analysis targeting medical workers in hospitals in China. A total of 313 samples were collected, out of which 274 available data samples were used for our empirical analysis. Regarding the demographic characteristics of this study, there were 136 (49.6%) males and 138 (50.4%) females. Only 4 (1.5%) participants were under 20 years old, 58 (21.2%) were between 20 to 24 years old, 42 (15.3%) were between 25 to 29 years old, 67 (24.5%) were between 30 to 34 years old, and 103 (37.6%) were 35 or older. In terms of education, 60 (21.9%) participants had technical secondary school education, 71 (25.9%) had completed junior college, 126 (46.0%) had completed undergraduate studies, 13 (4.7%) had completed masters, and 4 (1.5%) were doctors. Regarding their service time, 26 (9.5%) had worked for a year or less, 71 (25.9%) had worked for 1 to 3 years, 33 (12.0%) had worked for 3 to 5 years, 33 (12.0%) had worked for 5 to 7 years, and 111 (40.5%) had worked for 7 years or more.

Regarding marital status, 88 (32.1%) were unmarried, 183 (66.8%), were married, 0 (0%) were divorced, and 3 (1.1%) were marked as “other”.

3.2. Measurement

Involuntary overtime (conformity) refers to overtime that is caused by the implicit pressure of leaders through regulations or group norms. To measure the relationship conflict among medical staff working in Chinese medical institutions, this study used a tool mentioned in the studies of Watanabe and Yamauchi (2018). There was a total of 5 sample items included, such as, “I feel uneasy to leave even when my work is done, out of regard to my colleagues.” or “I feel uneasy to go back when my boss and superiors still remain in my ward.”

Involuntary overtime (workload) refers to extended overtime due to workload not being completed within normal working hours. To measure the relationship conflict among medical staff working in Chinese medical institutions, this study used a tool mentioned in the studies of Watanabe and Yamauchi (2018). The total number of items was 5. Sample items included “I have to work overtime because there is so much to be done in my ward.” or “I have to work over hours because I have to cover the manpower shortage in my ward.”

Job stress is defined as the stress generated during the work process (Jin & Song, 2012). To measure the relationship conflict among medical staff working in Chinese medical institutions, this study used a tool mentioned in the studies of Keller (1984).

The total item consisted of 3 items. Sample items included “I experience tension from my job.” or “Aspects of my job are a source of frustration to me.”

The desire for control in Machiavellian leadership is characterized by domination in relationships in order to minimize the degree to which others have power (Dahling, Whitaker, & Levy, 2009). To measure relationship conflict among medical staff working in Chinese, this study used a tool mentioned in the studies of Dahling et al. (2009). The total item consisted of 8 items. Sample items included “My leader likes to give orders in interpersonal situations.” or “My leader enjoys having control over other people.”

Emotional exhaustion refers to the feeling of being overstretched and exhausted about one's feelings (Maslach & Jackson, 1981). To measure relationship conflict among medical staff working in Chinese medical institutions, this study used a tool mentioned in the studies of Maslach & Jackson (1981). The total item consisted of 8 items. Sample items included “I feel emotionally drained from my work” and “I feel used up at the end of the workday.”

All items were measured on a 7-point Likert scale ranging from 1=Strongly Disagree to 7=strongly agree.

Figure 1 depicts the current research model.

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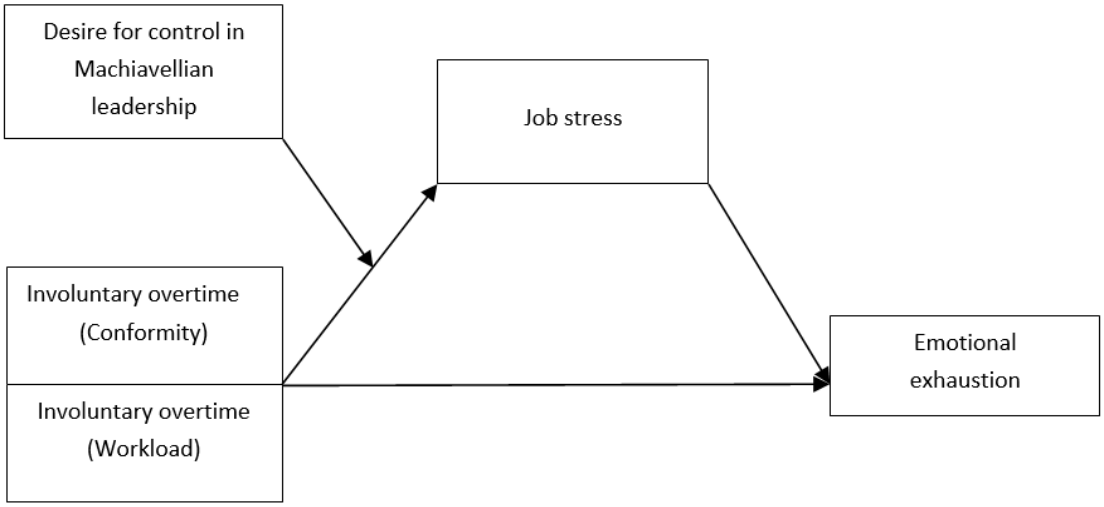

Figure 1. Research model.

4. RESULTS

4.1. Exploratory factor analysis and Reliability Analysis

Exploratory factor analysis (EFA) is a multivariate statistical procedure used to (i) reduce a large number of variables into a smaller set of variables, (ii) establish the underlying dimensions between measured variables and latent constructs, and (iii) provide construct validity evidence of self-reporting scales (Wiktorowicz, 2016). The variables used in the study were involuntary overtime (conformity), involuntary overtime (workload), job stress, the desire for control in Machiavellian leadership, and emotional exhaustion which were classified into five independent factors. Involuntary overtime (conformity) consisted of 5 questions, and the values of the measured questions ranged from 0.648 to 0.814 as factor 1. Involuntary overtime (workload) consisted of 5 questions, and the values of the measured questions ranged from 0.578 to 0.846 as factor 2. Job stress consisted of 3 questions, and the values of the measured question ranged from 0.504 to 0.608 as factor 3. The desire for control in the Machiavellian leadership style was measured using 8 questions, and the measured questions values ranged from 0.633 to 0.842 as factor 4. Finally, emotional exhaustion consisted of 8 questions, and the values of the measured questions ranged from 0.716 to 0.868 as factor 5. All factor values were above 0.5.

Reliability analysis refers to the degree of consistency or stability of questionnaire results (Zeng & Huang, 2005). The results of the reliability analysis used in this study are as follows: involuntary overtime (conformity) = .860, involuntary overtime (workload) = 0.882, job stress = 0.745, Machiavellianism desire for control = 0.930, and emotional exhaustion = 0.949. Therefore, the Cronbach's Alpha coefficient values are confirmed to be above 0.7 for the reliability analysis results of this study.

4.2. Descriptive Statistics and Correlation Analysis

The descriptive statistics analysis includes the mean and standard deviation (SD). The means for involuntary overtime (conformity), involuntary overtime (workload), job stress, the desire for control in Machiavellian leadership, and emotional exhaustion were 4.508, 4.957, 4.037, 3.819, and 4.047, respectively. In addition, the SDs for each variable were 1.392, 1.201, 1.193, 1.203, and 1.177, respectively. To verify the correlation between variables, we conducted a correlation analysis, and the results are summarized as follows: involuntary overtime (conformity) was positively associated with job stress (r=0.271, p<0.001), the desire for control in Machiavellian leadership (r=0.310, p<0.001), and emotional exhaustion (r=0.180, p<0.01). Involuntary overtime (workload) was positively associated with job stress (r=0.344, p<0.001), the Machiavellian desire for control (r=0.242, p<0.01), and emotional exhaustion (r=0.298, p<0.001). Job stress was positively associated with the desire for control in Machiavellian leadership (r=0.643, p<0.001) and emotional exhaustion (r=0.672, p<0.001). The desire for control in Machiavellian leadership was positively associated with emotional exhaustion (r=0.568, p<0.001).

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4.3. Discriminant Validity

The average value (Ave) of involuntary overtime (conformity) was .517, which was higher than the r^2 value of other variables (0.374, 0.043, 0.024, 0.109). The Ave value of involuntary overtime (workload) was 0.628, which was higher than the r^2 value of other variables (0.374, 0.123, 0.044, 0.028). The Ave value of job stress was .511, which was higher than the r^2 value of other variables (0.043, 0.123, 0.494, 0.372). The AVE (Average Variance Extracted) value of emotional exhaustion was 0.645, which was higher than the r^2 value of other variables (0.024, 0.044, 0.494, 0.277). The AVE value of the desire for control in Machiavellian leadership was .622, which was higher than the r^2 value of other variables (0.109, 0.028, 0.372, 0.277). The Ave value of all variables is higher than the correlation r^2 between variables. Therefore, the discriminant validity analysis of this study has been verified.

4.4. Hypothesis Test

Table 1 shows the AMOS (Analysis of Moment Structure) analysis conducted in this study. A total of eleven hypotheses were established. Firstly, this study verified the effect of involuntary overtime (conformity/workload) on job stress. Secondly, this study verified the effect of involuntary overtime (conformity/workload) on emotional exhaustion. Thirdly, this study verified the effect of job stress on emotional exhaustion. Fourthly, this study tested the mediating effect of job stress on the relationship between involuntary overtime (conformity/workload) and emotional exhaustion. A path analysis was performed using the AMOS 24.0 program to verify these hypotheses.

Hypothesis 1-1 suggested that involuntary overtime (conformity) would have a negative effect on job stress. Our results show that involuntary overtime (conformity) has a significant role on job stress (estimate=0.229, $p<.01$); therefore, Hypothesis 1-1 was supported. Hypothesis 2-1 suggested that involuntary overtime (conformity) would cause an increase in emotional exhaustion. Involuntary overtime (conformity) showed a significant correlation with increased emotional exhaustion (estimate=0.018, $p>.05$). Therefore, Hypothesis 2-1 is rejected.

Hypothesis 1-2 states that involuntary overtime (workload) has a negative influence on job stress. Our analysis shows that this is significantly true (estimate=0.484, $p<.001$), suggesting that involuntary overtime (workload) increases job stress. Hypothesis 2-2 proposes that involuntary overtime (workload) negatively influences emotional exhaustion. Our results, however, show that Involuntary overtime (workload) has a significant positive influence on emotional exhaustion (estimate=0.0, $p>.05$); therefore, Hypothesis 2-2 is rejected.

For involuntary overtime (conformity), we found that job stress has a negative effect on emotional exhaustion (estimate=0.670, $p<0.001$). Likewise, for involuntary overtime (workload), we established that job stress significantly negatively affects emotional exhaustion (estimate=0.695, $p<0.001$). Therefore, we can confirm that job stress has a positive effect on emotional exhaustion, supporting Hypothesis 3.

The indirect effect is 0.033, and the bootstrapped confidence intervals were Boot LLCI (Low Limit Confidence Interval) = 0.021 and Boot ULCI (Upper Limit Confidence Interval) = 0.304. As the interval does not include 0, we can conclude that bootstrapped confidence interval is significant.

Furthermore, we checked the model fit. The absolute fit index was $X^2(p)$=386.665(0.000), X^2/df=3.828, and RMSEA (Root Mean Square Error of Approximation) =0.102. The incremental fit index was IFI (Incremental Fit Index) =0.911 and CFI (Comparative Fit Index) =0.911. The parsimonious adjusted index was PNFI (parsimonious normed fit index) = 0.743 and PGFI (parsimonious Goodness-of-fit index) = 0.623. The results indicate that the mediating effect of job stress on the relationship between involuntary overtime (conformity) and emotional exhaustion has been verified. Therefore, hypothesis 4-1 is supported.

For Hypothesis 4-2, the mediating role of job stress was tested using 95% confidence intervals and 5000 bootstrapping resamples. The indirect effect was 0.002, and the bootstrapped confidence intervals were Boot LLCI (Low Limit Confidence Interval) = 0.175 and Boot ULCI (Upper Limit Confidence Interval) = 0.520. As the interval does not include 0, we can conclude that the bootstrapped confidence interval is significant.

Furthermore, we checked the model fir, and the absolute fit index was $X^2(p)$=417.789(0.000), X^2/df=4.243, and RMSEA (Root Mean Square Error of Approximation) = 0.109. The incremental fit index was IFI (Incremental Fit Index) =0.909, and CFI (Comparative Fit Index) =0.907. The parsimonious adjusted index was PNFI (parsimonious normed fit index) =0.721 and PGFI (parsimonious Goodness-of-fit index) =0.594. These results confirm the mediating effect of job stress on the relationship between involuntary overtime (workload) and emotional exhaustion, supporting hypothesis 4-2.

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Table 1. The result of mediating effect of job stress.

Dependent variable: Emotional exhaustion				
Path	**Estimate**	**S.E.**	**C.R.**	***p***
Involuntary overtime (Conformity) → Job stress	0.229	0.072	3.183	**
Involuntary overtime (Conformity) → Emotional exhaustion	0.018	0.050	0.356	0.722
Job stress → Emotional exhaustion	0.670	0.060	11.164	***
Indirect effect	Effect	Boot LLCI	Boot ULCI	
Involuntary overtime (Conformity)→ Job stress→Emotional exhaustion	0.033	0.021	0.304	
Model fit index	$X^2(p)$=386.665(0.000), X^2/df=3.828, RMSEA=0.102, IFI=0.911, CFI=0.911, PGFI=0.623, PNFI=0.743.			
Path	Estimate	S.E.	C.R.	*p*
Involuntary overtime (Workload) → Job stress	0.484	0.080	6.013	***
Involuntary overtime (Workload) →Emotional exhaustion	0.000s	0.061	0.004	0.997
Job stress → Emotional exhaustion	0.695	0.065	10.627	***
Indirect effect	Effect	Boot LLCI	Boot ULCI	
Involuntary overtime (Workload)→ Job stress → Emotional exhaustion	0.002	0.175	0.520	
Model fit index	$X^2(p)$=415.788(0.000), X^2/df=4.243, RMSEA=0.109, IFI=0.908, CFI=0.907, PGFI=0.594, PNFI=0.721.			

Note: ***:p<0.001, **:p<0.01.

Table 2. The result of moderating effect of desire for control in Machiavellian leadership between involuntary (conformity/workload) overtime work and job stress.

Dependent variable: Job stress							
Variable	**Model 1**		**Model 2**		**Model 3**		**VIF**
	β	***t***	***β***	***t***	***β***	***t***	
Involuntary overtime (Conformity)	0.271	4.638	0.079	1.629	0.100	2.051	1.131
Desire for control in Machiavellian leadership			0.618***	12.695	0.556***	10.485	1.343
Interaction (Moderating effect)					0.142**	2.815	1.214
R^2 (Adjusted R^2)	0.073(0.070)		0.419(0.415)		0.435(0.429)		
ΔR^2(ΔAdjusted R^2)	-		0.346(0.345)		0.016(0.014)		
F	21.512***		97.665***		69.416***		
Variable	Model 1		Model 2		Model 3		VIF
	β	*t*	*β*	*t*	*β*	*t*	
Involuntary overtime (Workload)	0.344	6.035	0.200	4.309	0.219	4.560	1.147
Desire for control in Machiavellian leadership			0.594	12.813	0.570	11.597	1.197
Interaction (Moderating effect)					0.072	1.483	1.168
R^2(Adjusted R^2)	0.118(.115)		0.451(0.447)		0.455(0.449)		
ΔR^2(ΔAdjusted R^2)	-		0.333(0.332)		0.004(0.002)		
F	36.425***		111.229***		75.214***		

Note: ***:p<0.001, **:p<0.01.

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This study aimed to test the moderating role of the desire for control in Machiavellian leadership on the relationship between involuntary overtime (conformity) and job stress. A multiple regression analysis was conducted using SPSS23.0 to verify the hypothesis. Hypothesis 5-1 established that desire for control in Machiavellian leadership moderated the effect of involuntary overtime (conformity) on job stress. The results showed that the desire for control in Machiavellian leadership significantly moderated the effect of involuntary overtime (conformity) on job stress (ß=0.142, p<0.01); therefore, Hypothesis 5-1 was supported. Table 2 shows the results of the moderating effect of the desire for control in Machiavellian leadership. In addition, Figure 2 shows high involuntary overtime (conformity) work increases job stress, and the effect is stronger when there is a high desire for control in Machiavellian leadership compared to a low desire for control in Machiavellian leadership.

The moderating role of the desire for control in Machiavellian leadership on the relationship between involuntary overtime (workload) and job stress was also tested. A multiple regression analysis was conducted using SPSS23.0 to verify the hypothesis. Hypothesis 5-2 failed to establish that the desire for control in Machiavellian leadership moderated the effect of involuntary overtime (workload) on job stress. The results showed that the desire for Machiavellian leadership had a non-significant moderated effect on the relationship between involuntary overtime (workload) and job stress (*ß*=0.072, p>0.05); therefore, Hypothesis 5-2 was rejected. Table 2 shows the results of the moderating effect of Machiavellian leadership's desire for control.

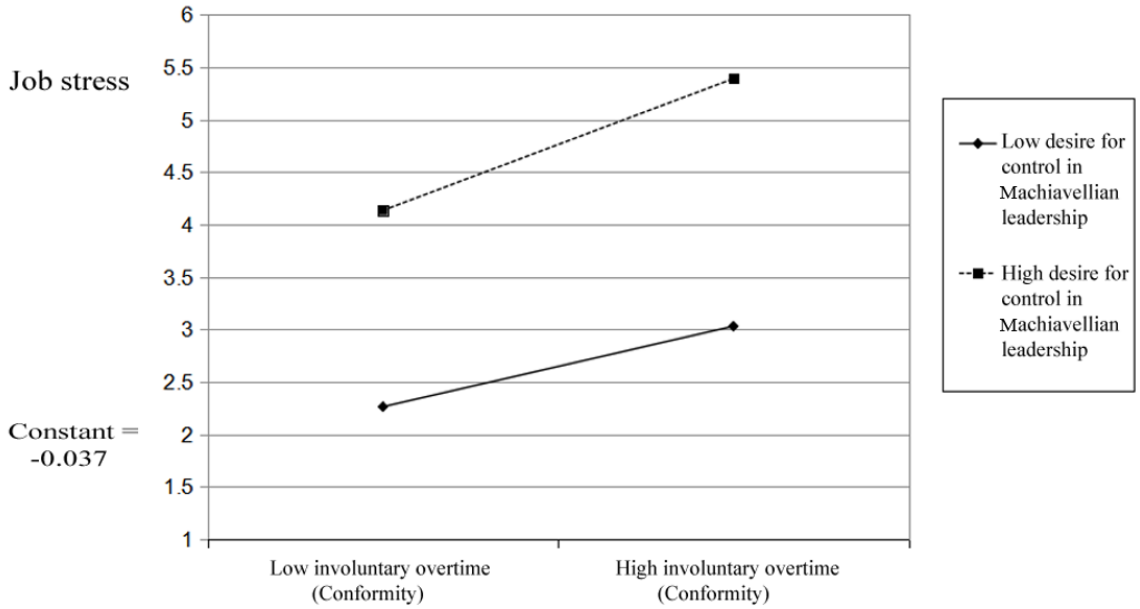

Figure 2. The graph of moderating effect.

The moderated mediation model was examined by using SPSS PROCESS Macro 3.4.1 Model 7, which was tested using 95% confidence intervals and 5000 bootstrapping resamples. The model was analyzed at three different moderator levels, which are −1 DS, the mean (M), and +1 DS. The level of –1 DS showed that the conditional indirect effect was -0.0015, Boot SE=0.0461, Boot LLCI (Low Limit Confidence Interval) =-0.0996, and Boot ULCI (Upper Limit Confidence Interval) =0.0820. The level of mean showed that the conditional indirect effect was 0.0567, Boot SE = 0.0302, Boot LLCI (Low Limit Confidence Interval) = -0.0006, and Boot ULCI (Upper Limit Confidence Interval) = 0.1198. In terms of the +1 DS level, the conditional indirect effect was 0.1148, Boot SE = 0.0379, Boot LLCI (Low Limit Confidence Interval) = 0.0480, and Boot ULCI (Upper Limit Confidence Interval) =0.1968. Since 0 was included between Boot LLCI (Low Limit Confidence Interval) and Boot ULCI (Upper Limit Confidence Interval) at the level of −1 SD (standard deviation) and the mean level (M) confidence intervals, we conclude that statistical significance was not confirmed. However, the index of moderated mediation was 0.0484, Boot SE=0.0245, Boot LLCI (Low Limit Confidence Interval) =-0.0081, and Boot ULCI (Upper Limit Confidence Interval) =0.1063. Additionally, in terms of the +1 DS level, as 0 was not included between the Boot LLCI (Low Limit Confidence Interval) and Boot ULCI (Upper Limit Confidence Interval), the moderated mediation effect of leader

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Machiavellian desire for control was significant. Therefore, Hypothesis 6-1 is supported. Table 3 shows the moderated mediation effect on the desire for control in Machiavellian leadership.

Finally, Hypothesis 6-2 validifies that the desire for control in Machiavellian leadership moderated the mediating influence of job stress on the relationship between involuntary overtime (workload) and emotional exhaustion. This was tested using 95% confidence intervals and 5000 bootstrapping resamples. The conditional indirect effect of involuntary overtime (workload) and emotional exhaustion was evaluated by analyzing the index of the moderated relationship at three different moderator levels: −1 DS, mean (M), and +1 DS.

Concerning the –1 DS level, the conditional indirect effect was 0.1087, Boot SE=0.0437, Boot LLCI=0.0020, and Boot ULCI=0.1951. Regarding the level of M, the conditional indirect effect was 0.1388, Boot SE = 0.0388, Boot LLCI (Low Limit Confidence Interval) = 0.0670, and Boot ULCI (Upper Limit Confidence Interval) = 0.2196. In terms of the +1 DS level, the conditional indirect effect was 0.1689, Boot SE = 0.0452, Boot LLCI (Low Limit Confidence Interval) = 0.0842, and Boot ULCI (Upper Limit Confidence Interval) =0.2651. Since 0 was not included between Boot LLCI (Low Limit Confidence Interval) and Boot ULCI (Upper Limit Confidence Interval) at the level of −1 SD (standard deviation), mean level (M), and mean +1 SD (standard deviation) confidence intervals, it was concluded that statistical significance was confirmed.

However, the index of moderated mediation was 0.0250, Boot SE=0.0181, Boot LLCI (Low Limit Confidence Interval) =-0.0060, and Boot ULCI (Upper Limit Confidence Interval) =0.0662. As 0 was included between Boot LLCI (Low Limit Confidence Interval) and Boot ULCI (Upper Limit Confidence Interval), the moderated mediation effect of leader Machiavellianism desire for control was not significant. Therefore, Hypothesis 6-2 was rejected. Table 3 shows a moderated mediation effect on the desire for control in Machiavellian leadership.

5. DISCUSSION

This study aims to explore the specific relationship between involuntary overtime (conformity/workload) and emotional exhaustion among members engaged in Chinese medical institutions, to confirm whether the mediating effect of job stress appears in the relationship between involuntary overtime (conformity/workload) and the identification of emotional exhaustion. A mediated moderation model was used, using job stress as a mediator, to confirm whether the path of involuntary overtime (prescriptive/workload) leading to identified emotional exhaustion depends on the level of the leader's Machiavellian desire for control. Based on empirical analysis, the results and implications of the research are summarized as follows:

First, the study found involuntary overtime (conformity/workload) of members working in Chinese medical institutions has a negative effect on work stress, thus supporting hypothesis 1-1 and hypothesis 1-2. Members engaged in Chinese medical institutions have a special occupational role, work nature, and work environment. For the safety of patients, daily high-intensity workload and overloaded overtime leads to more job stress.

Second, the study did not find a significant effect of involuntary overtime (conformity/workload) on emotional exhaustion, which means that Hypothesis 2-1 and Hypothesis 2-2 were rejected. Surveys have shown that involuntary overtime has a positive impact on personal achievement (Cai & Jin, 2022). Therefore, according to previous research, medical staff fosters professional ethics, even if they work overtime involuntarily, they will ensure patients' lives at all costs and ignore the negative effects regarding the safety of patients' lives.

Third, the job stress of members working in Chinese medical institutions is correlated with their emotional exhaustion; therefore, Hypothesis 3 is supported. The phenomenon is attributed to the high work pressure resulting from the nature and intensity of their work (Zhang & Liu, 2005). With the development of China's economy, people's awareness of health has gradually increased, leading to a significant increase in the workload of medical staff in Chinese medical institutions. Due to the demanding job and unique work characteristics, medical staff may experience physical and mental fatigue due to prolonged high tension and concentration.

Fourth, the job stress of members engaged in Chinese medical institutions showed a full mediating effect between involuntary overtime (conformity/workload) and emotional exhaustion. It can be seen that job stress from involuntary overtime (conformity/workload) is a key variable affecting emotional exhaustion. This shows that involuntary overtime (conformity/workload) affects emotional exhaustion through job stress; therefore, Hypothesis 4-1 and 4-2 were supported. The reason for this phenomenon is the particularity of the work of medical staff; involuntary overtime often occurs. Working in this state for a long time, such as having a high workload or a tense doctor-patient relationship, will generate work pressure, reduce the personal sense of achievement of medical staff, and cause emotional exhaustion.

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Table 3. The moderated mediation effect of the desire for control in Machiavellian leadership.

Involuntary overtime(conformity/workload)					
Dependent variable: Emotional exhaustion					
Moderator	**Level**	**Conditional indirect effect**	**Boot SE**	**Boot LLCI**	**Boot ULCI**
Desire for control in Machiavellian leadership	−1 SD (−1.2029)	-0.0015	0.0461	-0.0996	0.0820
	M	0.0567	0.0302	-0.0006	0.1198
	+1 SD (1.2029)	0.1148	0.0379	0.0480	0.1968
Index of moderated mediation					
Index		Boot SE		Boot LLCI	Boot ULCI
0.0484		0.0245		0.0081	0.1063
Desire for control in Machiavellian leadership	−1 SD (−1.2029)	0.1087	0.0437	0.0220	0.1951
	M	0.1388	0.0388	0.0670	0.2196
	+1 SD (1.2029)	0.1689	0.0452	0.0842	0.2651
Index of moderated mediation					
Index		Boot SE		Boot LLCI	Boot ULCI
0.0250		0.0181		-0.0060	0.0662

Fifth, the desire for control in Machiavellian leadership has a moderating effect between involuntary overtime (conformity) and job stress, but not between involuntary overtime (workload) and less stress. Therefore, Hypothesis 5-1 was supported, but Hypothesis 5-2 was rejected. This means that leaders will forcefully increase the workload of employees to meet their own goals. In the special working environment of the hospital, the medical staff cannot properly rest due to the nature of their work, and simultaneously increase their workload, which brings high work pressure to the medical staff for a long period.

Sixth, the desire for control in Machiavellian leadership does not moderate the mediating effect of positive work stress in the relationship between involuntary overtime (workload) and emotional exhaustion. The results showed that the desire for control in Machiavellian leadership failed to play a significant moderating role. This means that the work stress of medical staff is not mediated by the interaction of involuntary overtime (workload) and emotional exhaustion, and ultimately the media effect is not mediated. Therefore, Hypothesis 6-2 was rejected.

Based on the above empirical analysis of the results, this study can draw the following conclusions:

Firstly, the study highlighted the unique challenges of medical work, which often leads to unhealthy living habits among the medical staff. To address this, the organization should ensure that overtime is reasonably arranged for medical staff and their workload is appropriately allocated. Additionally, attention should be paid to the work-family situation of medical staff, which can improve their work enthusiasm and reduce job stress.

Secondly, the study reveals that leaders with a strong desire for control can negatively impact employees, resulting in higher psychological pressure. In the long run, the members will be disgusted with their work, resulting in emotional exhaustion. Therefore, the hospital should encourage its leaders to focus on strengthening their abilities, pay attention to humanized management, strengthen mutual trust with members, and improve members' autonomous work conditions.

Finally, the study emphasizes the direct link between work pressure and emotional exhaustion among medical staff. Therefore, hospitals should create a good working environment, improve working conditions, improve medical staff's work benefits, and improve medical staff's job satisfaction. In hospitals, special mental health centers can also be set up for medical staff to reduce their emotional consumption.

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5.1. Limitations and Future Research

While this study contributes to verifying the effect of work stress on the relationship between involuntary overtime (conformity/workload) and emotional exhaustion, it also has certain limitations.

First, being a cross-sectional study, it involved only one measurement. To further clarify these results, longitudinal studies should be conducted around the time gap in future research.

Second, this study only surveyed medical staff in China, which limits the generalizability of the findings to other countries or occupations. Although the study demonstrated the effects of involuntary overtime on emotional exhaustion among medical staff, it is unclear whether similar effects exist in other industries or countries. However, after sorting out the first research, it was found that the more involuntary overtime, the higher the emotional consumption. Therefore, in future research, we will examine the effect of involuntary overtime on emotional exhaustion for members of Chinese SMEs: small and medium-sized enterprises.

Third, the present study only focused on the mediating effect of job stress in the relationship between involuntary overtime (conformity/workload) and emotional exhaustion. However, in the study of Golparvar, Kamkar, and Javadian (2012), job stress was used as a moderator variable. Therefore, future research must be explored for the moderating variables that can determine the level of job stress to expand the research scope.

Fourth, Emotional exhaustion is one of the subordinate factors of job burnout. This study only focused on emotional exhaustion as a subordinate variable. Irregular working hours are associated with a higher risk of burnout (Peterson et al., 2019). Therefore, future research should explore the impact of involuntary overtime on job burnout.

Fifth, this study only focused on involuntary overtime as an independent variable. Previous research has shown that when the level of emotional exhaustion among members in the organization is high, the level of turnover intention, job satisfaction, cognitive happiness, etc. decreases. Therefore, future research should explore the impact on organizations with emotional exhaustion as an independent variable.

Sixth, while this study shows the negative effects of organizations when members involuntary work overtime for extended periods, Cai and Jin (2022) found that involuntary overtime has a positive effect on personal accomplishment. Therefore, future research should explore the positive effects of involuntary overtime in organizations.

Finally, psychological health among medical staff is a crucial aspect that must be studied. Previous research has already been conducted on measures to reduce depression, anxiety, and stress. In particular, Jin and Hahm (2021) demonstrated how support can reduce depression, anxiety, and stress. Future studies should focus on finding ways to enhance the psychological health of workers.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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AUTHORS' CONTRIBUTIONS

Both authors contributed equally to the conception and design of the study.

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