

The effects of Reduced Personal accomplishment on mood and mental state among railroad workers: The mediating role of work-family conflict

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ABSTRACT As work pressure increases, individuals are facing challenges of work-family conflict, emotional exhaustion, and reduced personal accomplishment. Objective: The present study aims to analyze the relationship between work-family conflict (WFC) and job burnout among railway employees, particularly the connection between low personal accomplishment and emotional exhaustion, and to explore the mediating roles of work interfering with family (WIF) and family interfering with work (FIW). Methods: A total of 293 employees from the Nanning Railway Bureau Group Co., Ltd. of China's Nankun Railway Line Engineering Section were surveyed using offline questionnaires. The WFC scale and the MBI-GS scale were utilized to assess work-family conflict, low personal accomplishment, and emotional exhaustion. The collected data underwent rigorous analysis using SPSS 27.0 and the Process macro program. Results: A negative correlation was identified between reduced personal accomplishment and emotional exhaustion, with the relationship between them being mediated by WIF. The mediating effect of FIW, however, was not found to be significant. Conclusions: A decline in personal accomplishment directly results in the depletion of emotional resources, with WIF partially mediating this relationship.

Keywords: Work-Family Conflict, Reduced Personal accomplishment, Emotional Exhaustion, Mediating Role

1 INTRODUCTION

Work-family conflict (WFC) is defined as the discord and strain experienced by individuals as they attempt to balance their professional and familial obligations. This conflict can arise from the impact of work on family life, known as Work Interference with Family (WIF), and the impact of family on work, known as Family Interference with Work (FIW) (Carlson et al., 2000). These two spheres—work and family—are distinct domains that can compete and conflict with each other, affecting an individual's performance and satisfaction in both areas. The issue of balancing work and family life has been a focal point of research and discussion for an extended period, yet it remains unresolved. Research has identified high levels of WIF and FIW in various populations, including teachers, healthcare workers, and police officers (W. Chen et al., 2021; Jerg-Bretzke et al., 2020; Wen et al., 2024; Zhang et al., 2023). Emotional exhaustion (Li & Shi., 2003) is a state in which an individual's emotional resources are depleted due to prolonged emotional investment and stress at work, leading to a very poor emotional

and mental state. It is the most critical component of job burnout, directly affecting an individual's work performance and physical and mental health. In this state, individuals may experience a loss of interest in life and work, accompanied by a sense of existential crisis and a perceived lack of purpose. Reduced personal accomplishment (Li & Shi., 2003) refers to an individual's doubt about their work achievements and contributions, leading to a perceived diminution of their accomplishments at work, a low self-evaluation of work performance, a reduced sense of competence, and a perceived lack of meaning in their work. Consequently, individuals may perceive that their work contributes marginally to society, organizations, and others, leading to self-doubt and a decline in job satisfaction. A systematic review study on emotional exhaustion and reduced personal accomplishment, which included 33 domestic and international studies, found detection ranges of 0–86.2% for emotional exhaustion and 0–87.1% for reduced personal accomplishment (Chen et al., 2024). The consequences of work-family conflict and reduced personal accomplishment, as well as emotional exhaustion, extend to employees' physical and mental health, family harmony, and social stability (Bian & Mohd, 2024; Chen & Meier, 2021; Hsieh et al., 2021; Li et al., 2021; Obrenovic et al., 2020).

Because of the unique nature of their work, railroad maintenance workers often experience intertwined problems of work-family conflict, emotional exhaustion, and reduced personal accomplishment that affect their job performance and mental health. In ensuring the safety and smooth operation of railroads, these workers often face conflicts between their work and family roles. The specific nature of their work often requires them to work long hours in remote areas, which makes it difficult to fulfill family responsibilities, resulting in work-family interference (WIF). This conflict not only increases family pressure but also makes it difficult for workers to concentrate on their work, which affects their job performance. At the same time, maintenance workers often face extreme weather, landslides, and other natural disasters that require a great deal of emotional and physical effort. Long-term, high-intensity work can lead to emotional exhaustion, in which workers feel exhausted, lose enthusiasm for their work and the meaning of their lives, and may even experience anxiety and depression (Koutsimani et al., 2019; Schonfeld & Bianchi, 2021; Xue et al., 2012). In addition, decreased personal accomplishment is also a significant problem faced by maintenance workers. Due to the harsh work environment and high pressure, workers may doubt their work accomplishments and feel that their efforts are not rewarded, leading to a reduced sense of self-worth. This low sense of accomplishment not only affects their job satisfaction but can also exacerbate emotional exhaustion. In summary, the work-family conflict, emotional exhaustion, and reduced personal accomplishment experienced by railroad maintenance workers interact to form a complex psychological state that is directly related to their job performance and physical and mental health. Therefore, it is particularly important to pay attention to the sense of accomplishment and emotional and mental state of maintenance workers.

2 RESEARCH SUBJECTS AND METHODS

b. Research Subjects and Survey Methods

The subjects of the study were 293 employees from the Nanning Railway Bureau Group Co., Ltd.'s Nankun Railway Line Engineering Section. The survey was administered via an offline questionnaire format.

c. Survey Content

The survey employed the Work-Family Conflict Scale, which was developed by Carlson (2000). This scale comprises six dimensions, with a total of 18 items, which are scored on a 5-point Likert scale. The scale's categories, ranging from 1 "rarely occurs" to 5 "always occurs," are as follows: 1) rarely occurs; 2) occasionally occurs; 3) sometimes occurs; 4) often occurs;

and 5) always occurs. Higher scores on this scale indicate greater levels of conflict. The overall alpha value of the questionnaire was 0.789, with alpha values of 0.772 for the Work Interference with Family subscale and 0.788 for the Family Interference with Work subscale, indicating good internal consistency (Carlson et al., 2000).

The survey utilized the Chinese version of the Maslach Burnout Inventory-General Survey (MBI-GS), translated and revised by Li Chaoping and Shi Kan (2003)(Li & Shi., 2003), to assess the emotional and mental states, as well as the level of achievement at work, among railway workers. The version of the MBI-GS employed in this study focused on two dimensions: Emotional Exhaustion and Reduced Personal Accomplishment, comprising a total of 11 items. The scale employs a 7-point Likert scale, where 0 represents "never," 1 indicates "once a year or less," 2 indicates "once a month or less," 3 indicates "several times a month," 4 indicates "once a week," 5 indicates "several times a week," and 6 represents "every day." Scores on the Emotional Exhaustion dimension that are higher suggest poorer emotional and mental states at work, while higher scores on the Reduced Personal Accomplishment dimension indicate a stronger sense of achievement. The Cronbach's alpha coefficients for the Emotional Exhaustion and Reduced Personal Accomplishment dimensions were 0.88 and 0.82, respectively, suggesting adequate internal consistency.

d. Data Analysis

The data analysis was conducted using SPSS 27.0, with the Process macro program, specifically Model 4, being utilized for the purposes of mediation analysis and model validation. A Bootstrap sample size of 5000 was set to obtain more accurate confidence intervals for the indirect effects, ensuring the robustness of the results. Statistically significant differences were defined as those with $P < 0.05$.

3 RESULTS

a. Correlational Analysis of Emotional Exhaustion, Personal Accomplishment, WIF, and FIW

As shown in **Table 1**, the findings of Pearson's correlation analysis indicated the presence of substantial intercorrelations among all variables. Personal accomplishment exhibited a negative correlation with the remaining variables, while the other variables demonstrated a significant positive correlation with each other ($P < 0.01$).

Table 1 Correlational Analysis of Emotional Exhaustion, Personal Accomplishment, WIF, and FIW

Project	Emotional exhaustion	Reduced Personal accomplishment	WIF	FIW
Emotional exhaustion	1	-0.373**	0.655**	0.459**
Reduced Personal accomplishment	-0.373**	1	-0.211**	-0.155**
WIF	0.655**	-0.211**	1	0.660**
FIW	0.459**	-0.155**	0.660**	1

b. Mediation Effect Analysis of Emotional Exhaustion, Personal Accomplishment, WIF, and FIW

As shown in **Table 2**, the ensuing conclusions are substantiated by the results of the mediation effect verification employing the stepwise regression method from Process. In the initial step (Model 1), the independent variable exhibited a substantial impact on the dependent variable ($\beta = -0.421$, $P < 0.001$), signifying that the total effect has been established, and the independent

variable is negatively associated with the dependent variable. In the second step (Model 2), the independent variable demonstrated a substantial negative correlation with the mediator WIF ($\beta = -0.227, P < 0.01$) and a significant negative correlation with the mediator FIW ($\beta = -0.188, P < 0.01$). In the third step, the independent variable still has a significant effect on the dependent variable. Specifically, personal accomplishment is negatively correlated with the dependent variable ($\beta = -0.227$), while WIF and FIW are positively correlated with the dependent variable ($\beta = 0.606, 0.046$). Consequently, the mediating roles of WIF.

As demonstrated in **Table 3 and Figure1**, the mediating effects in the model were examined through the implementation of the Bootstrap technique. The overall indirect effect was determined to be -0.145 (-0.215, -0.0754). The indirect effect of WIF was -0.138 (-0.211, -0.0681), indicating that WIF plays a significant mediating role in the model. In contrast, the indirect effect of FIW was -0.007 (-0.032, 0.0143), suggesting that it does not mediate the relationship. The direct effect was found to be -0.277 (-0.373, -0.181), thereby confirming the presence of a direct effect. Consequently, the findings indicate that FIW does not function as a mediator in the model, whereas WIF does.

Table 2 PROCESS stepwise regression method mediation effect test results translated into English according to academic requirements translation

Step	Dependent Variable	Independent Variable	R	R-sq	F	β	t
Step 1	Emotional exhaustion	Reduced Personal accomplishment	0.373	0.1391	47.024***	-0.421	-6.857***
Step 2	WIF	Reduced Personal accomplishment	0.211	0.0445	13.560**	-0.227	-3.149**
Step 3	FIW	Reduced Personal accomplishment	0.1549	0.024	7.152**	-0.188	-2.903**
Step 4	Emotional exhaustion	Reduced Personal accomplishment	0.6986	0.4881	91.841***	-0.277	-5.688***
		WIF				0.606	10.186***
		FIW				0.046	0.720

** $P < 0.01$, *** $P < 0.001$.

Table 3 Bootstrap Mediation Effect Test Results

Effect Relationship	Effect Value	LLCI	ULCI	Effect Proportion
Total Effect	-0.421	-0.542	-0.3004	
Direct Effect	-0.277	-0.373	-0.181	66%
Total Indirect Effect	-0.145	-0.215	-0.0754	34%
WIF	-0.138	-0.211	-0.0681	33%
FIW	-0.007	-0.032	0.0143	1%

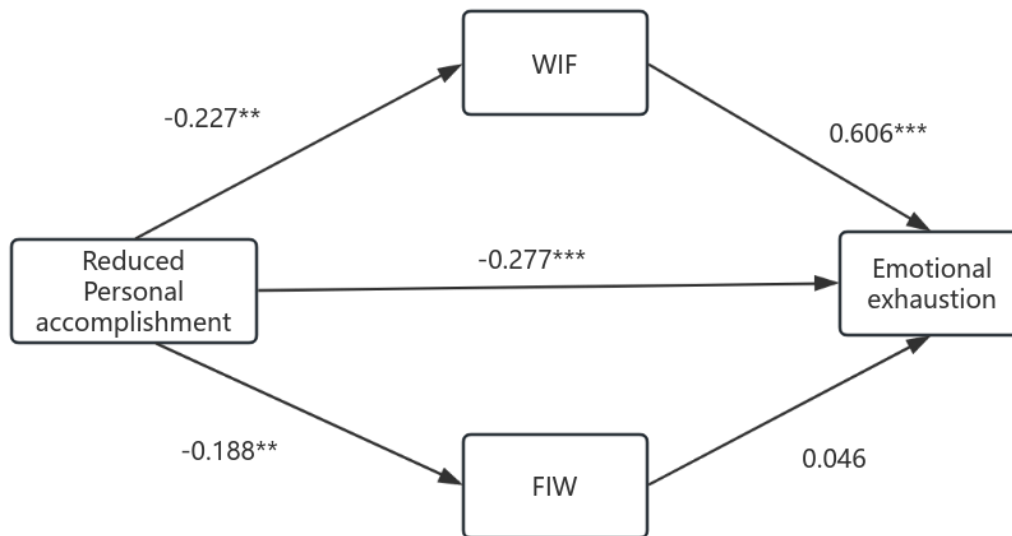


Fig. 1 Mediation Effect Test Path Diagram

4 DISCUSSIONS

Given China's rapid development and its commitment to achieving high-quality development, there has been a concomitant increase in the demand for railway transportation. The extensive implementation of high-speed rail has been shown to reduce the physical distance between cities (Jin et al., 2020), enhance the health conditions of local residents, increase personal income, household income per capita, and the probability of acquiring medical insurance, thereby promoting individual health levels (F. Chen et al., 2021). However, this transition has concomitantly engendered a substantial escalation in workloads and a contraction in leisure time for railway industry personnel, giving rise to symptoms of emotional exhaustion and a decline in personal accomplishment. The interplay between professional obligations and personal obligations has become a pronounced source of contention, leading to a marked deterioration in the quality of life for railway industry personnel.

In this study, Pearson correlation analysis revealed a significant negative relationship between reduced personal accomplishment and other variables, while the other variables exhibited a significant positive correlation with each other ($P < 0.01$), consistent with previous research findings (Bhuvanewari & Thirumoorthi, 2023; Kocalevent et al., 2020; Lambert et al., 2022). The findings of the mediation effect analysis employing the stepwise regression method from Process demonstrated that reduced personal accomplishment exerted a substantial negative influence on the dependent variable, emotional exhaustion, and exhibited a significant negative correlation with work-family conflict (WIF) and family-work conflict (FIW). The mediating effects of WIF and FIW were examined, and the findings indicated that WIF had a significant mediating effect, while FIW did not. The direct effect was also confirmed, indicating that reduced personal accomplishment has a direct negative impact on the dependent variable. This finding suggests that a decline in personal accomplishment can directly affect an individual's emotional and mental state, leading to the depletion of emotional resources and subsequently causing job burnout. The indirect effect of WIF on emotional exhaustion through its impact on FIW was also identified, thereby underscoring the complex interplay among these variables. This finding is consistent with numerous preceding studies that have demonstrated the substantial impact of WIF on employees' emotional and mental well-being (Liu et al., 2020;

Yang et al., 2023). Furthermore, there exist intricate pathways between WIF and emotional exhaustion (Cao et al., 2020; Zhou et al., 2024).

This study is not without its limitations. First, the failure to include more demographic variables that may affect the results constitutes a limitation. Second, the study's focus on employees from a specific railway company's engineering section limits the representativeness of the sample. Third, as this study is cross-sectional, it cannot determine the causal relationships between variables. Further validation through the establishment of relevant cohort studies is needed.

5 RESULTS

In this study, we found a significant negative correlation between reduced personal accomplishment and emotional exhaustion among employees in China's railway industry, indicating that a decrease in a sense of achievement directly leads to an increase in the depletion of emotional resources. Furthermore, work-family conflict (WIF) played a significant mediating role between reduced personal accomplishment and emotional exhaustion, while the mediating effect of family-work conflict (FIW) was not significant.

Ethical Approval: The study was reviewed and approved by the Ethics Committee of Youjiang Medical University for Nationalities and was conducted by the World Medical Association Declaration of Helsinki. Verbal informed consent was obtained from each recruited participant before the commencement of the questionnaire survey. The process of obtaining verbal informed consent was deemed acceptable and was approved by the Ethics Committee of Youjiang Medical University for Nationalities. All completed questionnaires were kept confidential. A detailed explanation of the study and its objectives was provided to all participants, with an emphasis on the confidentiality of the information obtained and the voluntary nature of participation.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The analyzed data sets generated during the study are available from the first author on a reasonable request.

Conflicts of Interest: The authors declare that they have no conflict of interest.

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