



The Influence of the Leadership Effectiveness of Nursing Supervisor LMX on the Tendency of Nursing Staff to Leave and Abnormal Events under the Five Personality Traits Regulation Field

Ting-Yi Liao

Chi Mei Medical Center, Yung Kang Dist., Tainan City 710, Taiwan, China

Abstract: This study aims to explore the influence mechanism of nursing supervisors' leader-member exchange (LMX) leadership efficacy on nursing staff turnover intention and the incidence of adverse medical events, while examining the moderating role of the Big Five personality traits in this process. A questionnaire survey was conducted among 376 clinical nursing staff at a medical center in southern Taiwan, with data analyzed using SPSS 25.0. Results indicate that nursing supervisors' LMX leadership efficacy exerts a significant negative influence on nursing staff turnover intention; turnover intention fully mediates the relationship between LMX and adverse events; and among the Big Five personality traits, Extraversion and Conscientiousness exert significant negative moderating effects on the relationship between turnover intention and adverse events. This study highlights the crucial role of personality traits in nursing management, providing empirical evidence and managerial insights for healthcare institutions to reduce turnover rates and enhance patient safety through optimized leadership styles and personnel selection strategies.

Keywords: LMX leadership efficacy; turnover intention; adverse medical events; big five personality traits; nursing management

1. Research Background

Globally, the shortage of nursing human resources has become a severe challenge confronting healthcare systems, and this issue is particularly prominent in Taiwan. According to data from the National Union of Nurses Associations of the Republic of China, the practicing rate of nursing staff has remained persistently low, while high turnover rates have further exacerbated the human resource crisis[1]. Nursing work is characterized by both high professionalism and immense pressure, and the quality of nursing services directly impacts patient safety and healthcare outcomes. Studies have shown that the persistently high nurse-to-patient ratio, heavy workload, and high-pressure work environment are key factors contributing to nursing staff's job burnout and turnover intention.

Among the numerous factors influencing nursing staff retention, the leadership style of nursing supervisors plays a crucial role. The Leader-Member Exchange (LMX) Theory posits that supervisors and subordinates develop exchange relationships of varying quality. High-quality LMX relationships — characterized by mutual trust, respect, loyalty, and responsibility — have been proven to effectively enhance employees' job satisfaction, organizational commitment, and work performance, while reducing their turnover intention[2]. However, in high-pressure healthcare environments, the internal mechanism by which LMX leadership effectiveness influences nursing staff's psychological states (e.g., turnover intention) and thereby affects medical adverse events related to patient safety remains to be further explored.

Furthermore, individual differences, particularly stable personality traits, may play a critical moderating role in the aforementioned influence mechanism. The Big Five Personality Trait Model (extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience) provides a robust theoretical framework for understanding individual behavioral differences under pressure. For instance, individuals with high conscientiousness are typically more responsible and organized, and may commit fewer work errors; whereas those with high extraversion are adept at social interaction and may cope with work pressure more effectively[3]. Therefore, exploring whether the relationship between turnover intention and the occurrence of adverse events varies among nursing staff with different personality traits holds significant theoretical and practical implications for achieving personalized and precision management of nursing human resources.

Based on the above background, this study constructs a moderated mediation model, aiming to systematically examine: (1) the impact of nursing supervisors' LMX leadership effectiveness on nursing staff's turnover intention and adverse events; (2) the mediating role of turnover intention in the relationship between LMX and adverse events; and (3) the moderating effect of the Big Five personality traits on the relationship between turnover intention and adverse events.

2. Research Process

2.1 Research Participants and Data Collection

A cross-sectional questionnaire survey was adopted in this study, with clinical nurses from a medical center in Tainan City, Taiwan, as the research participants. The inclusion criteria for participants were as follows: holding a nurse practitioner or registered nurse license, having worked in the hospital for more than three months, and possessing independent work capabilities[4]. After obtaining ethical approval from the hospital's Institutional Review Board (IRB), the study was conducted anonymously. Questionnaires were distributed and collected centrally by the principal investigator in various nursing units. A total of 380 questionnaires were distributed, and 376 valid questionnaires were retrieved, resulting in an effective recovery rate of 98.9%.

The sample characteristics were as follows: females accounted for 92.1% of the participants; the average age was 39.3 years (SD = 9.901); the average work tenure was 9.101 years (SD = 7.414); and the majority of participants had a bachelor's degree or above (61.3%).

2.2 Research Instruments and Variable Measurement

The questionnaire in this study consisted of the following sections:

Leader-Member Exchange (LMX) Leadership Effectiveness: A 7-item scale developed by Graen & Uhl-Bien (1995) was used to measure the quality of the exchange relationship between nurses and their supervisors as perceived by the nurses. The Cronbach's α coefficient of this scale in the study was 0.890.

Turnover Intention: A 3-item scale integrated and revised by Scott et al. (1999) was adopted to assess nurses' intention to leave their current positions. The Cronbach's α coefficient of this scale in the study was 0.874.

Big Five Personality Traits: The 20-item short version of the International Personality Item Pool (IPIP) scale, compiled by Goldberg (1999), was used. It includes five dimensions: extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience. The Cronbach's α coefficients of the five dimensions ranged from 0.49 to 0.74.

Medical Adverse Events: A self-designed 16-item scale was developed with reference to the classification standards of the Taiwan Joint Commission on Hospital Accreditation (TJCHA). It measures the frequency and severity of adverse events related to medication administration, medical tubing, falls, and other incidents experienced by nurses in the past six months. The Cronbach's α coefficient of this scale in the study was 0.705.

Control Variables: These included nurses' gender, age, educational level, marital status, job rank, and work tenure.

2.3 Data Analysis Methods

SPSS 25.0 software was used for data processing and analysis. First, descriptive statistics and correlation analysis were conducted to initially understand the relationships among variables[5]. Subsequently, hierarchical regression analysis was applied to test the impact of LMX on turnover intention (Hypothesis 1) and the mediating role of turnover intention (Hypothesis 2). Finally, by introducing the interaction term between the centered independent variable and the moderating variable, hierarchical regression analysis was performed to test the moderating effect of the Big Five personality traits (Hypotheses 3a–3e). The significance of the mediating effect was verified using Bootstrap sampling with 5,000 iterations.

3. Research Results

3.1 Descriptive Statistics and Correlation Analysis

The means, standard deviations, and correlation coefficients among the variables are presented in Table 1. LMX showed a significant negative correlation with turnover intention ($r = -0.516$, $p < 0.001$), while turnover intention demonstrated a significant positive correlation with abnormal events ($r = 0.182$, $p < 0.01$). These findings provided preliminary support for the subsequent hypothesis testing.

Table 1. Narrative Statistics and Correlation Analysis

Variable Name	M	SD	1	2	3	4	5	6	7
LMX	3.290	0.690							
Turnover intention	3.024	0.999	-0.516***						
Outgoing	2.797	0.732	0.129*	-0.114*					
Friendly	3.642	0.525	0.155**	-0.136**	0.425***				
Rigorous	3.692	0.509	0.106*	-0.097	0.085	0.290***			

Variable Name	M	SD	1	2	3	4	5	6	7
Stable	3.130	0.670	-0.131	0.235***	-0.137 -	0.084	-0.257***		
Imagination	3.212	0.641	0.088	-0.007	0.367***	0.319***	0.179***	-0.027	
Abnormal event	0.039	0.094	-0.097*	0.182***	0.097	0.027	-0.073	0.088	0.071

Note: *p < 0.1; **p < 0.05; ***p < 0.01.

3.2 Hypothesis Testing Results

The hierarchical regression analysis revealed that LMX had a significant negative predictive effect on turnover intention ($\beta = -0.516, p < 0.001$), thus supporting Hypothesis H1. Bootstrap testing indicated that the mediating effect of turnover intention in the relationship between LMX and abnormal events was significant (effect size = -0.008, 95% CI [-0.014, -0.004]). Furthermore, the direct effect of LMX on abnormal events was not significant, indicating that turnover intention played a fully mediating role, thereby supporting Hypothesis H2.

The examination of the moderating effects of the Big Five personality traits yielded the following results: The moderating effect of Extraversion was significant ($\beta = -0.012, p < 0.001$). Simple slope analysis indicated that the positive predictive effect of turnover intention on abnormal events was weaker for nursing staff with high extraversion, but stronger for those with low extraversion. Thus, Hypothesis H3a was supported.

The moderating effect of Conscientiousness was also significant ($\beta = -0.011, p < 0.005$). Its moderating pattern was similar to that of extraversion, suggesting that high conscientiousness can buffer the adverse impact of turnover intention on abnormal events. Although its main effect was not significant, the interaction term was significant. The direction of the moderating effect was consistent with the research expectation for Hypothesis H3b, providing partial support.

The moderating effect of Openness was significant ($\beta = 0.010, p < 0.05$). However, the direction was positive, meaning that high openness might potentially strengthen the impact of turnover intention on abnormal events. This finding was inconsistent with the hypothesized negative moderating effect in H3e; therefore, Hypothesis H3e was not supported.

The moderating effects of Agreeableness ($\beta = 0.002, p > 0.05$) and Emotional Stability ($\beta = -0.001, p > 0.05$) were not significant. Consequently, Hypotheses H3c and H3d were not supported.

4. Research Conclusions and Discussion

This study, through empirical data, validates the complex relationships among LMX leadership effectiveness, turnover intention, abnormal events, and the Big Five personality traits in the nursing management context.

Firstly, the research confirms that high-quality LMX relationships are an effective strategy for stabilizing the nursing workforce. When nursing supervisors establish relationships with subordinates based on trust, respect, and mutual support, it significantly reduces nursing staff's willingness to leave. This finding aligns with existing social exchange theory and LMX research, emphasizing that in nursing management, supervisors should not only focus on task allocation but also prioritize building high-quality interpersonal relationships with each subordinate[6].

Secondly, this study reveals the crucial mediating role of turnover intention in the process of how LMX affects patient safety. LMX leadership effectiveness itself does not directly reduce abnormal events; rather, it indirectly enhances work focus and stability by lowering the psychological state of turnover intention among nurses, thereby reducing errors. This indicates that reducing turnover intention is an important pathway to improving patient safety.

Finally, and most significantly in terms of practical implications, the findings show that nursing staff's personality traits indeed moderate the relationship between turnover intention and work outcomes (abnormal events). Nurses high in Extraversion due to their strong communication skills and ability to gain support from social interactions, can maintain work performance and reduce errors to some extent even when experiencing thoughts of leaving. Those high in Conscientiousness, owing to their inherent orderliness, responsibility, and attention to detail, possess a "natural barrier" against work negligence, allowing them to maintain higher work quality even under the pressure of high turnover intention. However, the **Openness** trait unexpectedly revealed a risk factor; nurses high in openness, potentially due to their active thinking and pursuit of variety, might be more prone to negligence in repetitive tasks when harboring intentions to leave, leading to an increase in abnormal events.

5. Summary and Recommendations

Based on the above conclusions, this paper proposes the following recommendations for the management practices of healthcare institutions:

- (1) Strengthen the Development of LMX Leadership Among Nursing Supervisors. Hospitals should incorporate LMX

theory into the training system for nursing managers, guiding supervisors in establishing high-quality leader-member relationships through effective communication, individualized care, resource support, and empowerment. Regularly assess LMX quality via anonymous surveys and provide timely feedback and coaching to supervisors to support continuous improvement.

(2) Incorporate Personality Trait Assessment in HR Selection and Placement. During the recruitment of nursing staff and internal team allocation, extraversion and conscientiousness should be considered as supplementary evaluation indicators. Situational simulations can be designed within interviews or assessment centers to observe candidates' organizational skills, sense of responsibility, and communication and collaboration abilities under pressure. Candidates who excel in these traits should be prioritized to build a more resilient nursing team.

(3) Identify and Intervene in High-Risk Groups Exhibiting Turnover Intention with Differentiated Support. Managers should proactively identify nursing staff with high turnover intention, paying particular attention to those low in extraversion and conscientiousness but high in openness. Enhanced support should be provided through one-on-one interviews, Employee Assistance Programs (EAPs), and similar resources to understand their challenges, offer necessary psychological support and work adjustments, and prevent their psychological state from deteriorating into actual safety risks.

(4) Fundamentally Optimize the Work Environment to Reduce Triggers for Turnover. Hospital administrators and policymakers should commit to solving problems at the systemic level. The most crucial aspect is the strict implementation of reasonable **nurse-to-patient ratios** to reduce the workload of nursing staff. Simultaneously, improve the compensation and benefits system, establish fair promotion channels, and foster a work culture that respects the professional value of nursing, thereby weakening the willingness to leave at its root.

6. Conclusion

In summary, this study systematically unveils the internal mechanisms affecting nursing staff turnover and patient safety from three levels: "leadership-psychology-individual traits." Future nursing management practices should abandon the "one-size-fits-all" model and instead adopt a refined and humanized management strategy that integrates excellent leadership behaviors, precise psychological insight, and scientific personality assessment. This approach aims to achieve the dual goals of retaining talent and ensuring safety in the turbulent healthcare environment.

References

- [1] Digman, J. M. Personality structure: Emergence of the five-factor model. *Annual Review of Psychology*, 1990,41: 417-440.
- [2] Dunn, D. Incident reports — correcting processes and reducing errors. *AORN journal*, 2003,78(2): 211-233.
- [3] Runciman, W. B., Sellen, A., Webb, R. K., Williamson, J. A., Currie, M., Morgan, C., & Russell, W. J. Errors, incidents and accidents in anaesthetic practice. *Anaesthesia and intensive care*, 1993, 21(5): 506-519.
- [4] Aspden, P., Corrigan, J. M., Wolcott, J., & Erickson, S. M. (Eds.) *Patient Safety: Achieving a New Standard for Care*. National Academies Press, 2004.
- [5] Wang Huiling, Dong Yonghao, Zhang Lili. Application and effect analysis of situational leadership model in nursing management [J]. *Modern health care*, 2025,25(18):1416-1418.
- [6] Wang Lei, Zong Rui. The multi-level drip drive mechanism of the emergence of digital leadership of the new generation of employees [J]. *China Human Resources Development*, 2025,42(04):83-103.

Author Bio

Tingyi Liao (born in October 1995), male, Tainan, Taiwan, Master's degree, nurse, research focus: nursing management.