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INVESTIGATING THE MEDIATING EFFECT OF EMOTIONAL INSTABILITY ON THE ASSOCIATION OF WORK–LIFE CONFLICT AND TIME PRESSURE WITH MEDICATION ERRORS

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Abstract

Background: Medication errors remain a critical patient safety concern worldwide, particularly in high-demand healthcare environments where nurses face persistent occupational stressors. Work–life conflict and time pressure are prevalent stressors in nursing practice and have been associated with impaired clinical performance. However, the psychological mechanisms underlying these relationships remain insufficiently explored, particularly the mediating role of emotional instability.

Aim and Objective: This study aimed to investigate the mediating effect of emotional instability on the relationship between work–life conflict, time pressure, and medication errors among hospital-based nurses.

Methodology: A quantitative, cross-sectional design grounded in the positivist paradigm was employed. Using a deductive approach, data were collected from 305 registered nurses through standardized and validated Likert-type instruments measuring work–life conflict, time pressure, emotional instability, and medication errors. Reliability and correlation analyses were conducted, followed by regression-based mediation analysis to test indirect effects. Statistical significance was determined at the 95% confidence level.

Results: Work–life conflict and time pressure were positively associated with medication errors. Both occupational stressors significantly predicted emotional instability, which in turn demonstrated a strong positive association with medication errors. Mediation analysis revealed that emotional instability fully mediated the relationship between work–life conflict and medication errors. In the multiple regression model, emotional instability emerged as the only significant predictor when all variables were entered simultaneously, highlighting its central explanatory role.

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Conclusion: Emotional instability functions as a key psychological mechanism linking occupational stressors to medication errors. Interventions targeting nurses' emotional regulation, alongside organizational strategies addressing workload and staffing, may substantially enhance medication safety and patient care outcomes.

INTRODUCTION

Medication mistakes are acknowledged as a primary cause of avoidable injury in healthcare settings and represent a significant global patient safety concern(Organization, 2017).When work obligations clash with personal and family obligations, it's referred to as work-life conflict. This causes stress and lowers job performance.(Greenhaus & Beutell, 1985).Another important consideration in healthcare settings is time pressure, particularly in hospitals with low staffing levels and significant patient turnover.(Holden et al., 2011).Nurses under time pressure are more likely to multitask, expedite operations, and neglect safety checks, which raises the risk of drug errors.(Westbrook et al., 2010).An major psychological aspect influencing job performance is emotional instability, which is characterized by mood swings, anxiety, anger, and trouble managing stress.(Widiger, 2011).Globally, the current scenario for healthcare infrastructures includes an increase in patient volumes, complexity, and resource constraints, thereby posing risks, as illustrated, to those individuals despite safety infrastructures, as vast surveillance and syntheses continue to establish and acknowledge the significant role dispensing and administration play as causes of some reported medication injury events.Nurses receiving the bulk of medication at their posts may face extreme amounts of work-life conflict (WLC) when professional responsibilities clash with family/personal responsibilities, and this has been correlated with stress, burnout, and performance .Current research findings show that this conflict has implications for the well-being, turnover intention, and stress-absenteeism of the nursing workforce, which re-emphasizes the pervasiveness, yet modifiability, of WLC (da Rocha, 2024).

The very prevalent occupation stressor of time pressure detracts from safe decision-making and heightens the risk of errors across nursing: consistently, nurses report not having enough time to

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get critical medication tasks done, whereas observational and survey research correlates shorter breaks, longer hours of overtime, and rushed workflows with increased self-reported rates of medication errors. Several reviews and systematic reviews (Hom, 2025) recognize gaps in information, workload surges, and interruptions as recurring causal factors to administration errors and refer to workload redesign and targeted intervention for safety(Poudel, 2025).

For instance, an investigation carried out in Peshawar found that close to half of all nurses in tertiary services had suffered at least one drug error during their recent occasions of drug administration jobsAhmadet.al(2025). In another study carried out in Karachi Hospitals, Khan et.al(2023), researchers undertook an investigation of drug errors caused by extended periods of time being at their posts for nurses. Such periods do not merely contribute to an enhancement of unpleasantness but also lead to emotional exhaustion.In their latest investigation, Rehman et al. (2024) examined the relationship of nurse workload linkages with nurse care quality within public hospital settings in the state of Punjab. Interestingly, increased nurse workload pressure and lack of administrative support have already been seen contributing factors for an increased rate of medication errors among nurse professionals. Furthermore, Saeed et al. (2025) have recently explored the link that nursing professionals experiencing increased degrees of emotional instability do indeed mediate their increased likelihood for committing medication errors among nurse professionals. Interestingly, these latest research assessments conducted among nurse professionals within Pakistan have reinforced that work–life conflict, increased pressure, and unstable nurse temperament are already well-known and alarming predictive factors for unsafe medication practices.Most literature examining WLC for nurses centers on missing nursing care and intentions for turnover instead of medicine errors events (Rhéaume et al., 2025). Most literature examining WLC and time pressure for medicine errors relies on reported or composite safety measures. However, it is obvious that such literature is dissatisfying because medicine errors underreporting is typified by cultural and administrative barriers. In other words, medicine errors are likely underestimated (Wawersik & Palaganas, 2022). Consequently, links between WLC and time pressure for actual medicine errors incidents are vague (Raju et al., 2025).In health care,

reviews of the model have illustrated, quite clearly, that it remains eminently relevant for analyzing errors. The model's lens has been used across industries to apply layered defense to various risk management frameworks, emphasizing that organizational culture, leadership, and communication are needed in order to effectively "plug" the holes and avoid alignment of failures (Sarjito, 2024). Finally, the model takes the focus off blaming the individual-namely, "the nurse made a mistake"-to system design with multi-layered protective strategies that align quite well with the implications of your study for both organizational and individual levels of intervention. Along that line, Shabani et al. (2023) further say that "the core concept of the model behind the multiple layers of defenses ".has been useful in charting how errors or failures happen within complex systems."(Yuan et al., 2025).The Swiss Cheese Model has been universally applied to explain how, in many healthcare organizations, patient safety, along with other industries like aviation and engineering, has utilized these findings to present how all these layers have to have a failing sequence before an adverse incident occurs, which includes organizational issues, supervision, and pre-conditions for unsafe acts (Wiegmann et al., 2022).Medication administration ranks among the most cognitively challenging and security-critical nursing activities, which demands meticulousness in accurate and accurate dose computation, rigorous adherence to intricate medication administration procedures, and unrelenting watchfulness for discrepancies in medication orders and medication responses. Any lapses in watchfulness can induce ADEs that compromise the security and security of the patient, increasing the cost and scope of hospitalization, and mortality (Unnissa et al., 2024). New research has shown that medication errors cannot always be attributed to the lapses and shortcomings of nurses only but can also be the consequence and outcome of a combination of different underlying and interrelated factors that contribute to nurses' inability to accomplish and carry out medication administration. For instance, theoring nursing staff, workload, and environmental distractions have been shown to be among the major determinants and causes of errors in medication administration and errors, following the systems approach. These nursing errors and medication errors arise particularly in acute and acute care environments where the pace and rate at which medication needs to be administered in hospitals, for instance, constitute

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and comprise multitasking activities and scenarios (Jessurun et al., 2023; Li et al., 2025).Applying the model to nursing practice explains how work–life conflict and time pressure act as chronic job demands that decrease psychological and emotional resources for nurses. Continuous exposure to demands reduces energy and emotion-regulation capacity, hence increasing the likelihood of lapses of attention in critical activities such as medication administration (Navajas-Romero et al., 2020). Indeed, empirical research within nursing demonstrates that sufficient resources, such as staffing levels, leadership support, and professional autonomy, buffer the negative effect of work-life conflict and workload on error rates (Viotti & Converso, 2016; Zhang et al., 2020). Thus, in the framework, emotional instability may be considered as the strain outcome intervening between excessive demands and reduced performance. This model is integrative in nature, as it can model both structural and psychological factors involving medication safety, making it quite apt as a theoretical basis for the current research (Tang & Vandenberghe, 2021).

Methodology

This study was conducted within the positivist research paradigm, which assumes that reality is objective and can be measured through systematic observation and statistical analysis. Consistent with this philosophical stance, a deductive approach was adopted to test theoretically derived hypotheses regarding the relationships among work–life conflict, time pressure, emotional instability, and medication errors. A mono-method quantitative, cross-sectional research design was employed, utilizing standardized self-administered questionnaires to collect numerical data from registered nurses working in hospital settings. The target population comprised practicing nurses across different hospital units and shifts, ensuring variability in workload and clinical exposure. A sample of 340 nurses was determined to be adequate for multivariate and mediation analysis, providing sufficient statistical power to detect medium effect sizes and minimize Type II error. An appropriate sampling strategy was applied to enhance representativeness and external validity.

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Data were collected using validated Likert-type instruments with established psychometric properties. Work–life conflict was measured using the Work–Family Conflict Scale developed by Netemeyer et al. (1996), time pressure was assessed through a 13-item scale adapted from contemporary occupational stress research, emotional instability was evaluated using the neuroticism dimension derived from the personality framework of Hans Eysenck, and medication errors were measured using the Medical Error Attitude Scale developed by Özata and Altunkan (2010). All instruments demonstrated acceptable reliability in prior studies. Data analysis was performed using statistical software, including descriptive statistics to summarize demographic and study variables, reliability analysis using Cronbach's alpha to assess internal consistency, and Pearson correlation to examine bivariate relationships. Regression-based mediation analysis was conducted to test the indirect effect of work–life conflict and time pressure on medication errors through emotional instability. Statistical significance was evaluated at the 95% confidence level, ensuring rigor and robustness in hypothesis testing.

Results

This section presents the findings of the statistical analyses conducted to examine the relationships among work–life conflict, time pressure, emotional instability, and medication errors among nurses. The results include descriptive statistics, reliability analysis, correlation analysis, mediation testing, and multiple regression analysis. Data were analyzed from 305 completed responses.

Descriptive Statistics

Table 1: summarizes the descriptive statistics for the study variables.

Variable	N	Minimum	Maximum	Mean	SD
Work–Life Conflict	305	11.00	69.00	49.98	13.02
Time Pressure	305	24.00	89.00	58.14	13.08
Emotional Instability	305	31.00	58.00	45.12	3.51
Medication Errors	305	20.00	109.00	82.93	16.88

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Nurses reported moderate to high levels of work–life conflict and time pressure, as indicated by relatively elevated mean scores. Emotional instability showed less variability (SD = 3.51), suggesting relatively consistent emotional response patterns across participants. Medication error scores displayed notable dispersion, indicating variability in perceptions and experiences related to medication safety.

Reliability Analysis

Table 2: The internal consistency of all instruments was assessed using Cronbach's alpha.

Scale	Number of Items	Cronbach's α
Work–Life Conflict	10	.918
Time Pressure	13	.807
Emotional Instability	20	.634
Medication Errors	16	.879

The Work–Life Conflict and Medication Error scales demonstrated excellent reliability, while the Time Pressure scale showed good reliability. The Emotional Instability scale demonstrated acceptable reliability for exploratory research.

Correlation Analysis

Table 3: Pearson correlation coefficients were computed to examine associations among variables.

Variable	1	2	3	4
1. Work–Life Conflict	–			
2. Time Pressure	.614	–		
3. Emotional Instability	.351	.238	–	
4. Medication Errors	.362	.247	.951	–

Note: $p < .01$

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Work–life conflict was strongly associated with time pressure and moderately associated with both emotional instability and medication errors. Time pressure was also positively related to emotional instability and medication errors. Emotional instability exhibited an exceptionally strong correlation with medication errors, indicating a close association between emotional dysregulation and error-related outcomes.

Mediation Analysis

Table 4: A regression-based mediation analysis was conducted to test whether emotional instability mediates the relationship between work–life conflict and medication errors.

Path	B	SE	t	p	95% CI
WLC → EIS	0.471	0.070	6.73	<.001	0.334 – 0.608
EIS → MES	0.918	0.014	69.84	<.001	0.891 – 0.945
WLC → MES (Total Effect)	0.472	0.066	7.15	<.001	0.343 – 0.601
WLC → MES (Direct Effect)	0.029	0.016	1.81	.071	−0.002 – 0.060
Indirect Effect	0.443	0.079	—	—	0.288 – 0.598

Work–life conflict significantly predicted emotional instability, which in turn significantly predicted medication errors. The direct effect of work–life conflict on medication errors became non-significant when emotional instability was included, while the indirect effect remained significant. These findings indicate full mediation, suggesting that emotional instability explains how work–life conflict contributes to medication errors.

Multiple Regression Analysis

Table 5: A multiple regression model examined the combined effects of work–life conflict, time pressure, and emotional instability on medication errors.

Predictor	B	SE B	β	t	p
Work–Life Conflict	0.029	0.016	.026	1.81	.071
Time Pressure	0.024	0.015	.023	1.42	.156

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Emotional Instability	0.922	0.013	.951	72.88	<.001

Emotional instability emerged as a strong and statistically significant predictor of medication errors. In contrast, work–life conflict and time pressure did not significantly predict medication errors when emotional instability was included in the model. This pattern further supports the mediating role of emotional instability in linking occupational stressors to medication errors.

Summary of Findings

The results indicate that work–life conflict and time pressure are associated with increased medication errors, primarily through their impact on emotional instability. Emotional instability functions as a key psychological mechanism explaining how occupational stress translates into clinical performance outcomes.

Discussion

The current study looked at how emotional instability mediated the association between nurses' medication errors, time pressure, and work-life conflict. The results showed that medication errors were positively correlated with both work-life conflict and time pressure, which is consistent with earlier studies showing that occupational stress is a significant factor in compromised patient safety(Holden et al., 2011; Organization, 2017).High levels of work-life conflict might make it difficult for nurses to maintain emotional and cognitive equilibrium, which can impair focus and raise the risk of clinical errors(Greenhaus & Beutell, 1985).The findings also showed that work-life conflict was a strong predictor of emotional instability, which is in line with research showing that nurses who have to balance work and personal obligations experience more psychological stress and emotional tiredness(da Rocha, 2024).Time pressure was also found to have a significant impact on emotional instability, which is consistent with earlier research showing that a heavy workload and hectic clinical settings impair emotional control and judgment(Hom, 2025; Westbrook et al., 2010).These findings support the knowledge that proper medicine delivery

procedures might be hampered by time restrictions inhealthcaresettings.

Most significantly, the mediation analysis showed that the association between medication mistakes and occupational stressors was totally mediated by emotional instability. This result confirms previous studies that suggested emotional dysregulation serves as a psychological conduit for occupational stress, which in turn results in decreased clinical performance and elevated safety hazards(Li et al., 2025).The results are also in line with the Swiss Cheese Model, which argues that mistakes happen when a number of personal and systemic weaknesses come together to cause unfavorable results(Wiegmann et al., 2022). One prerequisite that makes people more prone to risky clinical behaviors is emotional instability.

Additionally, prior research showing that nurses with higher emotional reactivity are more likely to make mistakes in attention and violate protocol when administering medication supports the strong predictive significance of emotional instability seen in this study(Jessurun et al., 2023; Li et al., 2025).Since proper staffing, leadership support, and workload management have been demonstrated to mitigate stress-related medication mistakes, the findings further highlight the significance of organizational support systems(Viotti & Converso, 2016; Zhang et al., 2020).

Overall, the results show that in order to improve drug safety outcomes, healthcare organizations must adopt holistic methods that address nurses' emotional well-being as well as professional pressures.

Conclusion

According to the study's findings, nurses' medication errors are largely caused by work-life conflict and time constraints, which predominantly affect emotional instability. The results demonstrate that one important psychological mechanism connecting dangerous pharmaceutical practices and work stress is emotional instability. These findings highlight the significance of attending to nurses' mental health as well as organizational stresses. Medication errors may be decreased and patient safety results in healthcare settings may be enhanced by putting workload management techniques, sufficient personnel, and psychological support programs into practice.

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