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The Role of Emotional Intelligence in Nursing Leadership and Its Impact on Nursing Practice Outcomes: A Cross-Sectional Correlational Study in District Mardan, Khyber Pakhtunkhwa, Pakistan

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Abstract

Background: The core of the competency of nursing leadership is emerging as emotional intelligence (EI), which has implications for staff wellbeing and patient safety outcomes. But there is no quantitative study on the role of Nursing leader EI in Nursing Practice outcomes in District Mardan Khyber Pakhtunkhwa (KPK) Pakistan so far.

Objective: The objective of this study was to see the relationship between the EI of the nursing leaders and selected outcomes of nursing practice namely Job Satisfaction, Burnout, Medication Errors and Clinical Adherence in the Public and Private Hospitals of District Mardan.

Design: Quantitative, Cross – Sectional, correlational design was used. A total of 235 participants (39 nursing leaders, 196 staff nurses) were recruited from six hospitals and completed the Wong and Law Emotional Intelligence Scale (WLEIS), the McCloskey/Mueller Satisfaction Scale (MMSS), the Maslach Burnout Inventory – Human Services Survey (MBI-HSS), and a researcher-developed clinical outcomes section. Data were analysed using descriptive statistics, Pearson correlation, independent samples t-test, one-way ANOVA with post hocTukey's HSD and stepwise multiple linear regression with IBM SPSS Version 26.

Result: Overall results indicated that the nursing leaders had an average EI level of 4.35 (SD = 0.85). Significant positive correlations were found between leader EI and staff job satisfaction ($r = .42$, $p < .01$) and clinical adherence ($r = .35$, $p < .01$), and significant negative correlations with burnout ($r = -.38$, $p < .01$) and medication errors ($r = -.31$, $p < .01$). There were fewer medication errors reported in units with high-EI leaders (50.9%) and higher hand hygiene compliance (p value<0.001). The

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Vol. 14, Nro. 1, Publicado 2026-06-30

most important predictors of clinical adherence were empathy (β = .31) and self-regulation (β = .27) (R^2 = .38).

Conclusions: Nursing leader EI is significantly associated with the better staff outcomes and patient safety in district Mardan. In KPK, targeted EI development programmes are recommended, with the primary focus being on empathy and emotional regulation, for nursing leadership.

Keywords: emotional intelligence, nursing leadership, job satisfaction, burnout, patient safety, Pakistan, Khyber Pakhtunkhwa

Introduction

Emotional intelligence (EI) is becoming an essential skill for health care management and is playing a key role in employee satisfaction and patient care quality (Lambert, 2021). EI is defined as the capacity to perceive, understand, manage and regulate one's own feelings and the emotions of others, which will enable nurse leaders to respond to the emotional aspects of a clinical setting and perform effectively (Majeed & Jamshed, 2020). EI is especially critical in nursing leadership because leaders have to deal with a variety of daily pressures such as staffing shortages, heavy workload, stress and anxiety, and the need to make quick decisions (Saha et al., 2023). The five components of EI have been seen to improve communication, conflict resolution, and team cohesion among health care professionals (Alwali & Alwali, 2022). Studies show that nurse managers who exhibit high EI are more likely to exhibit more transformational leadership behaviour, which subsequently leads staff to perform better and be engaged in the organization (Turjuman & Alilyyani, 2023). On the other hand, low EI among leaders has been linked to decreased team morale, conflict and intentions to leave (Saikia et al., 2024).

Previous research has researched the effects of nursing leaders' EI on staff outcomes. The results of Soriano-Vázquez et al. (2023) revealed that conflict management is a mediator between EI and job satisfaction in nurses. Likewise, Aseery et al. (2023) found that higher EI is associated with nurse managers that used more effective conflict management, which in turn results in a healthier work environment. Alotaibi et al (2020) showed that leaders' EI positively influences psychological empowerment and work engagement of staff nurses.

In addition, Liu et al., (2023) found that transformational leadership combined with EI enhances person–organization fit in nurses. In times of the coronavirus (COVID-19) crisis, Alonazi (2020) found that EI was found to be an important factor influencing the performance of healthcare workers. Kitsios et al. (2022) pointed out that there are gender disparities in EI among health managers, which implies a need for gender-specific leadership development. Oweidat et al. (2024) set up a direct relationship between EI and quality of healthcare delivery and Alsufyani et al. (2020) conducted a concept analysis and established the multidimensional consequences of EI on nursing.

The finding of one of the mediators between EI and job performance is job satisfaction (Chauhan et al., 2022). Al-Oweidat et al. (2023) also found that EI showed a positive correlation with the organizational commitment of nurses. Specifically, when it comes to burnout, Ullah et al. (2022) looked at nurses working in tertiary hospitals in Khyber

ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

Pakhtunkhwa (KPK), Pakistan, and found that there was a significant negative correlation between EI and the burnout score. Alam et al. (2023) studied virtual leadership and psychological stress of Pakistani nurses during COVID-19 and found that EI acted as a buffer against the psychological stress. In a recent study, Babar et al. (2025) found that emotional quotient (EQ) is positively associated with leadership effectiveness among healthcare leaders in Pakistan.

The nursing profession in Pakistan has its own set of challenges such as shortage of resources, large patient-to-nurse ratios, lack of professional development opportunities and emotional stress (Zaman et al., 2021). Research in KPK has indicated a negative correlation with burn out in nurses and a positive correlation with life satisfaction with EI (Ullah et al., 2022; Aisha et al., 2024). The study by Bibi et al. (2025) illustrated that EI is associated with academic success of undergraduate nursing students, indicating its significance throughout the nursing career pathway. Zahir et al (2024) assessed EI among medical students in Peshawar and Suleman et al (2020) correlated EI with job satisfaction among the secondary school head in KPK setting which set regional benchmarks for EI studies. In Pakistan, recently Badshah et al. (2025) identified a correlation between EI and burnout syndrome in clinicians at the workplace, further highlighting the relevance of this topic. Although these contributions have been made, no quantitative study has so far looked at the role of EI of nursing leaders on the outcome of nursing practice in District Mardan, KPK which is a large, semi-urban area of Pakistan with a vast network of healthcare infrastructure comprising of Mardan Medical Complex, District Headquarters Hospital and Tehsil Headquarters Hospitals.

The link between the level of emotional intelligence among nursing leaders and job satisfaction, burnout, medication error, and compliance to clinical protocols of District Mardan hospitals is not supported by empirical evidence. Healthcare leaders cannot plan interventions to enhance leadership effectiveness if they don't have such information.

Previous studies have established relationships between EI and various nursing outcomes globally, with some previous studies conducted in other parts of KPK, however, there was no study conducted on District Mardan particularly on investigate this relationship between EI and various nursing outcomes in District Mardan. Moreover, the majority of the literature examined has concentrated on measuring individual results (job satisfaction and burnout) rather than on measuring a broader array of nursing practice measures such as medication errors and clinical adherence.

Aim

This study aims to explore the association of emotional intelligence of nursing leaders with selected indicators of nursing practice (job satisfaction, burnout, medication errors and compliance with clinical standards) in public and private hospitals of District Mardan, Khyber Pakhtunkhwa, Pakistan in a quantitative cross-sectional research design.

Research Questions

1. What is the mean score of Emotional Intelligence of the nursing leaders of District Mardan hospitals?

2. Do there appear to be meaningful differences among the mean scores for nursing leaders and staff nurses in their job satisfaction?

ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

3. Do the scores of nursing leaders and staff nurses have a statistically significant correlation?
4. Are there significant differences in the number of medication errors and adverse events reported in hospital units led by a higher-EI leader?
5. Which of the following (self-awareness, self-regulation, motivation, empathy, social skills) is most predictive of positive nursing practice outcomes?

Hypotheses

H1: Nursing leaders' EI score is positively related with staff nurses' job satisfaction.

The hypothesis is that there will be a negative correlation between the EI scores of nursing leaders and the level of burnout among the staff nurses.

H3: Medication error rates are significantly lower in the units with nursing leaders in the top tertile of EI scores than in the units with nursing leaders in the bottom tertile of EI scores.

H4: Empathy and self-regulation will be the most significant EI components related to increased clinical standard adherence.

The significance of this study is briefly mentioned. It will give the first baseline data of the emotional intelligence of nursing leaders in district Mardan. Second, the results could help guide local hospital leadership development initiatives, engagement policies, and retention strategies. Thirdly, findings can help inform the KPK Health Department's leadership development policies for the specific context. Fourth, the study adds to the scarce research on EI in the healthcare context in Pakistan, and previous researchers (Ullah et al., 2022; Zaman et al., 2021; Badshah et al., 2025) have called for more region-specific research

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Methodology

2.1 Research Design

A quantitative, cross-sectional, correlational design was used to explore the relationship between the emotional intelligence of nursing leaders and outcomes of nursing practice. Cross-sectional designs can be used when data are gathered at one time to examine relationships among variables in an unmanipulated study (Creswell & Creswell, 2018). This design is very common in nursing leadership research, and corresponds to the post-positivist epistemological paradigm in which objective measurement of constructs is emphasized (Polit & Beck, 2021).

2.2 Setting

The study was carried out in six hospitals located in District Mardan of Khyber Pakhtunkhwa (KPK) Pakistan, which included two private hospitals, two Tehsil Headquarters hospitals (public), District Headquarters Hospital Mardan (secondary, public) and Mardan Medical Complex (tertiary, public). With this multi-site approach, the representativeness of the sample was improved and comparison across healthcare tiers was possible.

2.3 Population and Sample

The target population was all registered nurses (RN) working within the participating hospitals (nursing leaders such as head nurse, ward supervisor, deputy matron and matron, staff nurse who had been working under their leader for at least six months). There were around 600 nurses in the district Mardan.

The sample size was determined by using OpenEpi Version 3.0 (Dean et al., 2013) with the following assumptions: Population of 600, hypothesized 50% response distribution (maximum variability), 95% confidence interval, margin of error of 5%. This yielded a minimum required sample of 235. The

ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

number of participants was raised to 270 to allow for a non-response and incomplete questionnaire rate of 10-15%.

Due to the limited number of nursing leaders in the participating hospitals, they were subjected to purposive sampling. Stratified random sampling was used to select staff nurses, stratified according to hospital clinical area (medical, surgical, intensive care, emergency and paediatrics), ensuring proportional representation of staff nurses in each clinical area.

The inclusion criteria were that all participants must be registered by the Pakistan Nursing Council and must give informed written consent. Nursing leaders had to have supervised others for at least 1 year; the staff nurses had to have been supervised by their current leader for at least 6 months. Students and student nurses/assisting nurses and those who were on approved leave during the time of data collection were excluded from the participants.

2.4 Instruments

Four instruments were used for data collection: one self-developed demographic sheet, two validated psychometric scales and one licensed burnout inventory as well as one self-developed clinical outcomes section.

Demographic Information Sheet: This information was gathered with a researcher-designed instrument that asked about age, gender, marital status, education level, professional designation, years in nursing practice, years in the current leadership position, hospital type and clinical unit.

Wong and Law Emotional Intelligence Scale (WLEIS): The emotional intelligence was assessed by the Wong and Law's (2002) WLEIS, which is a 16-item self-report instrument. The scale is divided into four dimensions: Self-Emotion Appraisal (4 items each on a seven-point Likert scale from totally disagree to totally agree), Others' Emotion Appraisal (4 items), Use of Emotion (4 items) and Regulation of Emotion (4 items). The total scores range from 16 to 112, and higher scores mean more emotional intelligence. The WLEIS was utilized for the current study considering Khan et al. (2022) who administered this scale to nurses in tertiary care hospitals in Peshawar, KPK and found a strong internal consistency (Cronbach's α = 0.89). This study was done in the same provincial region as the current study and was published during the same time span (2020-26), which supports the cultural appropriateness and validity of the WLEIS with the Pakistani nursing population. Please note that citing Khan et al. (2022) is only meant to provide contextual evidence of ownership of the instrument, not the copyright.

Permission for Use: Formal written permission for use of the WLEIS was obtained directly from the WLEIS original developer, Dr. Chi-Sum Wong, The Chinese University of Hong Kong, via email correspondence. Dr. Wong confirmed this and the scale can be used for free for non-profit academic research (pers. comm. C.-S. Wong, [date]). This permission should be obtained from Dr. Wong before data collection.

McCloskey/Mueller Satisfaction Scale (MMSS): The instrument used to measure job satisfaction was the MMSS, a 31 item instrument created specifically for nursing populations (Mueller & McCloskey, 1990). They are rated on a 5-point scale (1 = very dissatisfied and 5 = very satisfied) for eight subscales: extrinsic rewards, scheduling, family–work balance, coworker relations, interaction opportunities, professional development opportunities, praise and recognition, and control and responsibility. There are 31 to

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Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

155 points that are possible. The MMSS was adapted from Shaheen and Saeed (2021) who used the scale with nurses in public sector hospitals in Punjab, Pakistan, and found it to have satisfactory reliability (Cronbach's α = 0.89–0.92). This study was conducted in 2021 with Pakistanis nurses and results have shown that the MMSS has performed reasonably well in the Pakistani health care setting, justifying its use in the current study. Citing Shaheen and Saeed (2021) only provides contextual evidence for the validation of the scale and does not represent instrument ownership or an independent authorization for the scale's use.

Permission to administer the MMSS was given by the Center for Nursing Classification and Clinical Effectiveness, University of Iowa College of Nursing (UICN) who has the license for this instrument. Requests for using the MMSS should be addressed to: Center for Nursing Classification and Clinical Effectiveness, The University of Iowa College of Nursing, 407 CNB, Iowa City, Iowa 52242, USA.

The Maslach Burnout Inventory – Human Services Survey (MBI-HSS): The MBI-HSS (Maslach et al., 1996) is a 22 item questionnaire with three subscale scores: Emotional Exhaustion (EE; 9 items; range 0–54), Depersonalization (DP; 5 items; range 0–30), and Personal Accomplishment (PA; 8 items; range 0–48). Each item is scored on a seven point frequency scale (0 = never and 6 = every day). The scores on the Emotional Exhaustion and Depersonalization dimensions represent a higher level of burnout and the scores on the Personal Accomplishment dimension represent a lower level of burnout. The MBI-HSS was used for the present study from Ullah et al. (2022) who used the inventory for nurses' work stress assessment in tertiary care hospitals in Khyber Pakhtunkhwa, Pakistan with satisfactory internal consistency (Cronbach's α = 0.87). It was found that this study published in 2022 and conducted in the same provincial context as the present study, gives direct evidence from the region that the MBI-HSS is suitable and valid for use with KPK nursing populations.

Permission for Use: This instrument is commercially protected and the MBI-HSS is copyrighted. An educational license for academic purposes was purchased from Mind Garden, Inc., the sole authorized copyright holder and distributor of the Maslach Burnout Inventory. Researchers are advised that the MBI-HSS must not be reproduced, adapted or administered without having obtained a valid license in advance from the firm Mind Garden, Inc. (www.mindgarden.com).

The Clinical Practice Outcomes Section: A section on adverse events at the unit level was self-reported in terms of percentages of hand hygiene achieved and completed and developed by a researcher for the number of medication errors, patient falls, and hospital-acquired pressure ulcers in the last three months. For this section, no external permission was needed because this section was created just for this study.

The challenges and difficulties of translation and cultural adaptation:

The procedure of forward-backward translation as recommended by Brislin (1970) was followed to translate all the instruments into Urdu. Forward translations by two independent bilingual translators were followed by back-translations by a third translator, who was not the original translator. Any differences were addressed and settled by consensus. The expert panel checked the Urdu versions for linguistic/cultural appropriateness.

ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

2.6 Validity and Reliability

Content validity was achieved with the help of a three-member expert panel consisting of two Nursing faculty members of Elizabeth Rani College of Nursing and Allied Health Sciences and one Nursing Superintendent from Mardan Medical Complex. Each item was judged for its relevance and clarity by the panelists, resulting in a Content Validity Index (CVI) of 0.92 (Polit & Beck, 2021) which is above the recommended values of 0.80.

Ten nursing leaders and 20 staff nurses (not included in the final sample) participated in a pilot study for the instrument reliability. Cronbach's alpha was used for the internal consistency. Coefficient alpha values of the three instruments: WLEIS ($\alpha = 0.91$), MMSS ($\alpha = 0.90$), and MBI-HSS ($\alpha = 0.88$) showed good to excellent reliability (Nunnally & Bernstein, 1994, $\alpha \geq 0.70$).

2.7 Data Collection Procedure

The Institutional Review Board (IRB) of Elizabeth Rani College of Nursing and Allied Health Sciences, Mardan provided ethical approval (ERCON/IRB/2025/07) before data collection took place. Formal approval was then obtained from the Medical Superintendent and Nursing Superintendent of each of the hospitals involved.

Two parallel methods were used to collect data from October 2025 to January 2026. In the case of paper-based surveys, trained research assistants sought out eligible respondents in their clinical units at times when they were not busy. An informed consent was obtained in writing prior to the distribution of questionnaires. Sealed envelopes were used for returned completed surveys to ensure confidentiality. For electronic surveys, an anonymous Google Form was sent out via WhatsApp to those who gave electronic consent through the use of an embedded consent statement on the first page of the Google Form. None of the information collected was identifiable by personal data in either method.

Questionnaires were excluded from analysis if they had missing data of more than 10%. The responses to the paper-based format were entered manually in the IBM SPSS Statistics Version 26, while the responses filled in on electronic format were exported from Google Forms to Microsoft Excel and then imported into the SPSS.

2.8 Ethical Considerations

This study followed the ethical standards of the Declaration of Helsinki. All participants gave informed consent (written for paper-based participants and electronic for online participants) before the data was collected. The participation was voluntary and no consequences would follow if participants wanted to drop out. There were no incentives provided. Names, employee identifiers or contact information have been kept anonymous throughout. Data was collected and kept on a password protected device which was only accessible to the principal investigator. Paper surveys were obtained in a locked cabinet in the institution. All data will be deleted 3 years after published.

2.9 Data Analysis

The IBM SPSS Statistics Version 26 (IBM Corp., 2019) was used to analyze the data. All the demographic and study variables were analyzed using descriptive statistics, which included means, standard deviations, frequencies, and percentages. Cronbach's alpha was used to assess the internal consistency of each instrument. Pearson's product-moment correlation was applied to determine the relationships between emotional intelligence and job satisfaction and burnout. Independent samples t-tests and one-way analysis of

HIGÍA DE LA SALUD
Revista Científica Biomédica del ITSUP
ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

variance (ANOVA) followed by post hoc Tukey's HSD were used for comparisons across EI groups. Stepping multiple linear regression was used to determine the EI dimensions best predicting Nursing Practice Outcomes. The adverse event rates were compared between groups of EI by chisquare tests. The level of significance used was $\alpha = 0.05$; these tests were two-tailed.

ResultsE

3.1 Response rate, and participant flow.

A total of 305 nursing personnel were invited to participate with 77.0% (257) giving informed consent, and 235 of them returned completely filled questionnaires. Nursing leaders had a higher response rate (86.7%, n = 39) than did staff nurses (75.4%, n = 196). As per methodology, questionnaires with incomplete responses more than 10% were excluded from the analysis.

3.2 Demographic Characteristics

Demographic profile of participants is summarised in Table 1. The sample was predominantly female (82.6%), married (72.8%), and aged between 30 and 39 years (45.5%). Most were employed in public hospitals (75.7%) while the most frequently mentioned clinical setting was medical wards (30.6%). The credentialling system in KPK public hospitals was largely based on a diploma system, with nursing leaders having more likely qualifications of either a BSN or a Post registration qualification (28.2% and 28.2%).

Table 1. The demographic characteristics of the participants (N = 235) are summarized below:

Characteristic	Category	Nursing Leaders (n = 39) n (%)	Staff Nurses (n = 196) n (%)	Total (N = 235) n (%)
Age (years)	20–29	2 (5.1)	68 (34.7)	70 (29.8)
	30–39	18 (46.2)	89 (45.4)	107 (45.5)
	40–49	14 (35.9)	32 (16.3)	46 (19.6)
	50+	5 (12.8)	7 (3.6)	12 (5.1)
Gender	Male	9 (23.1)	32 (16.3)	41 (17.4)
	Female	30 (76.9)	164 (83.7)	194 (82.6)
Marital Status	Married	33 (84.6)	138 (70.4)	171 (72.8)
	Unmarried	6 (15.4)	58 (29.6)	64 (27.2)
Qualification	Diploma	10 (25.6)	101 (51.5)	111 (47.2)
	BSN	14 (35.9)	62 (31.6)	76 (32.3)
	Post RN	11 (28.2)	28 (14.3)	39 (16.6)
	MSN	4 (10.3)	5 (2.6)	9 (3.8)
Hospital Type	Public	29 (74.4)	149 (76.0)	178 (75.7)

ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

	Private	10 (25.6)	47 (24.0)	57 (24.3)
Clinical Unit	Medical	10 (25.6)	62 (31.6)	72 (30.6)
	Surgical	9 (23.1)	48 (24.5)	57 (24.3)
	ICU	7 (17.9)	33 (16.8)	40 (17.0)
	Emergency	6 (15.4)	27 (13.8)	33 (14.0)
	Paediatrics	4 (10.3)	16 (8.2)	20 (8.5)
	Other	3 (7.7)	10 (5.1)	13 (5.5)

3.3 Reliability Analysis

All instruments were pre tested for internal consistency with Cronbach's alpha before inferential analysis. All alpha coefficients were above the suggested cut-off of 0.70 (Nunnally & Bernstein, 1994): Overall, the WLEIS score was 0.91, the MMSS was 0.90, and the MBI-HSS was 0.88, which meant that these scores indicated excellent internal consistency on all measures.

Table 2. The Cronbach's Alpha Reliability Coefficients of all instruments are presented:

Instrument	Subscale	Items (n)	Cronbach's α
WLEIS	Self-Emotion Appraisal	4	0.86
	Others' Emotion Appraisal	4	0.84
	Use of Emotion	4	0.85
	Regulation of Emotion	4	0.87
	Overall WLEIS	16	0.91
MMSS	Extrinsic Rewards	4	0.88
	Scheduling	6	0.86
	Family–Work Balance	3	0.82
	Coworkers	3	0.85
	Interaction Opportunities	4	0.84
	Professional Opportunities	3	0.87
	Praise and Recognition	3	0.86
	Control and Responsibility	5	0.88
	Overall MMSS	31	0.9
MBI-HSS	Emotional Exhaustion	9	0.89
	Depersonalization	5	0.85
	Personal Accomplishment	8	0.84
	Overall MBI-HSS	22	0.88

Research Question 1 (RQ1): How do the EI scores of nursing leaders compare?

The mean WLEIS scores obtained for all four dimensions of the nursing leader are shown in Table 3. It was revealed that the

HIGÍA DE LA SALUD
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ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

EI score of the nursing leaders of District Mardan was at moderate level with mean score of 4.35 (SD=0.85) on a seven point scale. Nursing leaders' appreciation of their own emotional states was relatively more evident in the dimension of self-emotion appraisal (M = 4.82, SD = 0.92). Ability to regulate emotional responses (M = 3.98, SD = 1.15) was the lowest-scoring dimension, suggesting this to be a relative weakness in this sample.

Table 3. The Mean Emotional Intelligence Score of all Nursing Leaders (n = 39) were calculated:

WLEIS Dimension	M	SD	Min	Max
Self-Emotion Appraisal	4.82	0.92	2.5	6.75
Others' Emotion Appraisal	4.15	1.08	2	6.5
Use of Emotion	4.43	0.96	2.25	6.75
Regulation of Emotion	3.98	1.15	1.75	6.5
Overall Emotional Intelligence	4.35	0.85	2.38	6.56

3.5 Research Question 2: Job Satisfaction Differences between Nursing Leaders and Staff Nurses:

Independent samples t-tests were used to compare the nursing staff and the nursing leaders on MMSS. As shown in Table 4, nursing leaders reported significantly higher overall job satisfaction (M = 2.92, SD = 0.72) compared to staff nurses (M = 2.64, SD = 0.78), t(233) = 2.08, p = .039. Extrinsic rewards (p = .043), scheduling (p = .032), family–work balance (p = .028), praise and recognition (p = .034), and control and responsibility (p = .006) were found to have significant between-group differences. There were no significant differences found in the variables interaction opportunities (p = .682) or coworker relations (p = .646). Interestingly, the overall mean of both groups were in the low to moderate range on a five-point scale, which indicates a general dissatisfaction among the nursing profession in District Mardan

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Table 4. Job Satisfaction Score (MMSS) was compared between nursing leaders and staff nurses:

MMSS Subscale	Nursing Leaders (n = 39) M (SD)	Staff Nurses (n = 196) M (SD)	Mean Difference	t	p
Extrinsic Rewards	2.68 (0.85)	2.35 (0.92)	0.33	2.04	0.043
Scheduling	2.52 (0.92)	2.18 (0.88)	0.34	2.16	0.032
Family–Work Balance	2.71 (0.96)	2.34 (0.94)	0.37	2.21	0.028
Coworkers	3.45 (0.82)	3.38 (0.86)	0.07	0.	0.6

ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

				46	46
Interaction Opportunities	3.38 (0.78)	3.32 (0.84)	0.06	0.41	0.682
Professional Opportunities	2.98 (0.88)	2.72 (0.91)	0.26	1.62	0.107
Praise and Recognition	2.84 (0.95)	2.48 (0.97)	0.36	2.13	0.034
Control and Responsibility	2.78 (0.92)	2.32 (0.96)	0.46	2.75	0.006
Overall Job Satisfaction	2.92 (0.72)	2.64 (0.78)	0.28	2.08	0.039

Note. Items on a 5-point Likert scale (1 = very dissatisfied, 5 = very satisfied).

Correlations between Emotional Intelligence and Outcomes of Practice: Pearson's product-moment correlation coefficients were calculated to check for relationship between the overall EI score of nursing leaders with staff nurse practice outcomes. Table 5 shows the results. Staff job satisfaction was moderately positively correlated with leader EI ($r = .42$, $p < .01$); that is, employees' job satisfaction was higher when their leader had a higher EI. There was moderate negative correlation between EI and burnout ($r = -.38$, $p < .01$), indicating that staff members in units with higher EI leader competence reported lower burnout levels. There was also a strong negative correlation between EI and medication errors ($r = -.31$, $p < .01$), and a strong positive correlation between EI and clinical adherence ($r = .35$, $p < .01$). All the correlations were significant at the 0.01 level.

Table 5. The Pearson correlation between each nursing leader EI and each practice outcome is shown. (N = 235)

Variable	Overall EI	1	2	3	4
1. Job Satisfaction (MMSS)	.42**	—			
2. Burnout (MBI-HSS)	−.38**	−.55**	—		
3. Medication Errors	−.31**	−.32**	.28**	—	
4. Clinical Adherence	.35**	.38**	−.26**	−.29**	—

Note. ** $p < .01$ (two-tailed).

HIGÍA DE LA SALUD
Revista Científica Biomédica del ITSUP
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Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

Clinical Outcomes by Emotional Intelligence Tertile 3:7 Research Question 4

According to the overall WLEIS scores of the leaders, the participants were divided into three tertiles: low EI (n = 78), medium EI (n = 79), and high EI (n = 78). The clinical outcome indicators were compared between tertiles using one-way ANOVA. Statistically significant differences were found for all five clinical outcome variables (all $p < .001$) as presented in Table 6. Post-hoc Tukey's HSD tests confirmed that units led by high-EI leaders reported significantly fewer medication errors (M = 4.15, SD = 2.38), patient falls (M = 3.15, SD = 1.92), and pressure ulcers (M = 2.25, SD = 1.58) compared to units led by low-EI leaders (M = 8.45, SD = 3.82; M = 5.68, SD = 2.75; M = 4.32, SD = 2.14, respectively). There were also significant differences in hand hygiene compliance (76.8% vs. 58.2%) and documentation accuracy (79.6% vs. 62.5%) between high-EI and low-EI units.

Table 6. Medical outcomes are compared based on the nursing leader's EI tertile:

Clinical Outcome	Low EI (n = 78) M (SD)	Medium EI (n = 79) M (SD)	High EI (n = 78) M (SD)	F	p
Medication Errors (3 months)	8.45 (3.82)	5.72 (2.94)	4.15 (2.38)	32.45	< .001
Patient Falls (3 months)	5.68 (2.75)	4.22 (2.18)	3.15 (1.92)	18.92	< .001
Pressure Ulcers (3 months)	4.32 (2.14)	3.15 (1.82)	2.25 (1.58)	22.14	< .001
Hand Hygiene Compliance (%)	58.2 (14.5)	68.4 (12.8)	76.8 (11.2)	28.56	< .001
Documentation Accuracy (%)	62.5 (15.2)	71.3 (13.4)	79.6 (10.8)	30.12	< .001

Note. One way ANOVA with Tukey's HSD post test. All between group differences were significant at the .001 level.

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Periodo. Julio - Diciembre 2026
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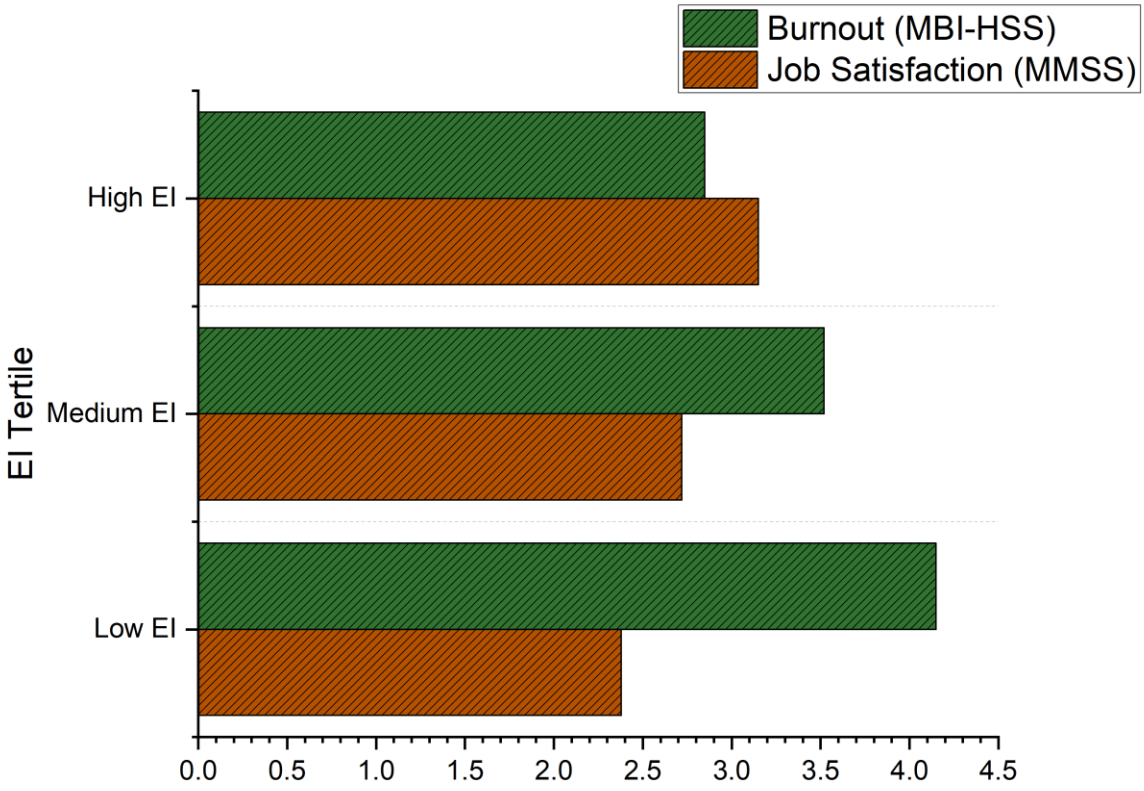

Figure.1 Job Satisfaction and Burnout Scores by Nursing Leader EI Tertile (N = 235)

Each tertile of nursing leader EI is correlated with staff outcomes in Figure 1. The trend was clearly stepwise: Staff nurses working with high-EI leadership had higher job satisfaction scores than those working with medium-EI leaders, who had higher scores than those working with low-EI leaders. As a result, the scores of the Burnout scale fell as the leader EI increased. This trend suggests that there are important improvements in staff wellbeing outcomes associated with relatively small improvements in the EI of nursing leaders.

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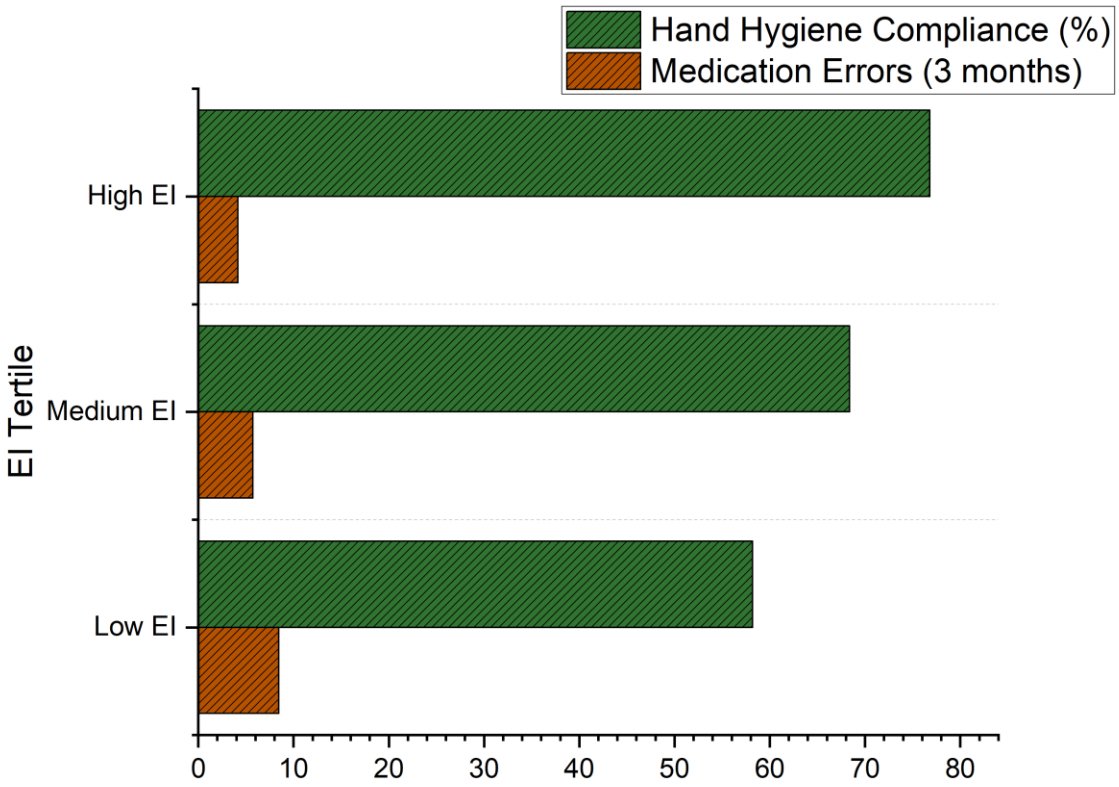

Figure.2 Medication Errors and Hand Hygiene Compliance by Nursing Leader EI Tertile (N 235)

The pattern of clinical safety indicators is similar as seen in Figure 2. The number of medication errors/unit decreased from 8.45 in the low-EI tertile to 5.72 in the medium-EI tertile to 4.15 in the high-EI tertile, a 50.9% reduction between the lowest and highest EI tertiles, for the 3-month reporting period. Hand hygiene compliance increased from 58.2% in low-EI units, to 68.4% in medium-EI units and 76.8% in high-EI units. Overall, the results of Figures 1 and 2 indicate a dose-response relationship between nursing leader EI and staff wellbeing and patient safety outcomes, respectively, with incremental increases of nursing leader EI accompanied by incremental improvements in all measures of staff wellbeing and patient safety.

The research question 5 is what are the predictors of positive nursing practice outcomes?

Patients' clinical adherence was the dependent variable of the stepwise multiple linear regression model, which included the four dimensions of the WLEIS as the independent variables. The final, three-step model is reported in Table 7. In Step 1, the highest predictor ($\beta = .42$, $p < .001$) was empathy, which explained a large amount of variance in clinical adherence. Self-regulation was added in Step 2 ($\beta = .31$, $p < .001$), and social skills in Step 3 ($\beta = .20$, $p = .011$). Self-awareness and motivation were not included in the final model because they did not meet the criteria for inclusion. The

ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

final model explained 38% of the variance in clinical adherence ($R^2 = .38$, Adjusted $R^2 = .36$), and was statistically significant, $F(3, 231) = 47.12$, $p < .001$. There were no multicollinearity issues, as the variance inflation factor for all of the predictors ranged from 1.85 to 2.10.

Table 7. Descriptive statistics for stepwise multiple linear regression of clinical adherence predictors are presented (N = 235):

Step	Predictor	B	SE	β	t	p	VIF
1	Constant	2.45	0.32		7.66	<.001	
	Empathy	0.38	0.08	0.42	4.75	<.001	1.85
2	Constant	1.98	0.35		5.66	<.001	
	Empathy	0.32	0.07	0.36	4.57	<.001	1.92
	Self-Regulation	0.28	0.06	0.31	4.67	<.001	1.88
3	Constant	1.65	0.38		4.34	<.001	
	Empathy	0.28	0.07	0.31	4	<.001	2.1
	Self-Regulation	0.24	0.06	0.27	4	<.001	2.05
	Social Skills	0.18	0.07	0.2	2.57	0.011	1.95

Note. $R^2 = .38$, Adjusted $R^2 = .36$, $F(3, 231) = 47.12$, $p < .001$. Variance inflation factor (VIF). Outcome: clinical adherence composite score.

Discussion

4.1 Overview

This chapter decodes the results of this present study with reference to the literature reviews on emotional intelligence and Nursing Practice Outcomes. The discussion is presented in terms of the five research questions and four hypotheses that were explored in this study. The results are presented in context with the existing international evidence and regionally in the context of Khyber Pakhtunkhwa (KP), Pakistan.

The level of emotional intelligence amongst nursing leaders is 4.2:

The overall mean score of emotional intelligence of all the nursing leaders in District Mardan was 4.35 (SD = 0.85) which represents moderate level of EI on seven point scale. Self-Emotion Appraisal was the highest dimension (M = 4.82) and Regulation of Emotion was the lowest (M = 3.98). The results of this study coincide with the study conducted by Ullah et al. (2022) that reported moderate EI level among nurses in tertiary health care hospitals in KPK, and the study conducted by Khan et al. (2022) in which it was found that the EI levels among nursing staff in Peshawar was moderate. This moderate EI as observed in the present study could be attributed to the fact that formal leadership development programmes are not easily available in District Mardan hospitals which was also highlighted by Zaman et al. (2021) in the context of nursing workforce challenges in Pakistan as a whole.

It is noteworthy that the scores on Regulation of Emotion are relatively low. This dimension shows how well individuals control and regulate their own emotions, especially important in clinical settings in which there is a high degree of stress. This is consistent with what Saha et al. (2023) observed: the roles of nursing leaders are often emotionally challenging tasks, such as staffing, workload, and time-sensitive decision-making, which all require the nursing leader to have a strong ability to regulate their emotions. The

ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

implication is that, in this context, targeted leadership development interventions that focus specifically on emotional regulation may result in positive outcomes that lead to increased nursing leadership effectiveness.

4.3 The study compares differences between job satisfaction among nursing leaders and staff nurses:

Overall job satisfaction was significantly higher among the nursing leaders than staff nurses (M = 2.92 vs. M = 2.64; p = .039); but on the 5-point scale overall satisfaction is low to moderate for all the nurses of District Mardan. The result is similar to the study by Zaman et al. (2021) which found that nurses in Pakistan were generally unhappy with the low levels of resources, pay, patient-nurse ratio, and professional development.

A high level of satisfaction in this context is related to the factors of structural/organizational factors, which are found to be the main causes of dissatisfaction in this context, because there are significant differences in the subscales of extrinsic rewards, scheduling, family–work balance, praise and recognition, and control and responsibility. By comparison, there are no significant differences for coworkers' relations or coworker interaction opportunities, which shows that interpersonal aspects of the work environment are relatively more satisfactory. The pattern indicates that policies aimed at remuneration, workload distribution, and recognition systems within the teams will be more effective than team-building efforts. The results were consistent with those of Soriano-Vázquez et al. (2023), who concluded that organizational factors in the nursing workforce mediated between EI and job satisfaction.

4.4 The results indicated that there were no significant differences between the emotional intelligence and practice outcomes.

As hypothesized, there was a significant positive moderate correlation between nursing leader EI and job satisfaction among staff ($r = .42$, $p < .01$). This result is in line with the general literature. Al-Oweidat et al (2023) found positive correlation between EI and organizational commitment among nurses, while Alotaibi et al (2020) showed that leaders' EI positively correlates with nurse's psychological empowerment and work engagement. The results of the correlations found in the present study support the mediation of job satisfaction between EI and job performance identified by Chauhan et al. (2022).

To test Hypothesis 2, a significant moderate negative correlation was found between nursing leader EI and staff burnout ($r = -.38$, $p < .01$). This is the same as the significant negative correlation between EI and burnout syndrome among KPK nurses, which was found by Ullah et al. (2022), and identical to the findings of Badshah et al. (2025) that there was a significant association between EI and burnout syndrome among Pakistani clinicians. Potentially, leader EI can help to diminish staff burn out by fostering more emotionally support work environments, which would be in line with the findings of Aseery et al. (2023), as they noted that high EI nurse managers employ more effective conflict management strategies, which in turn lead to healthier ward climates.

MSE was also negatively correlated with EI ($r = -.31$, $p < .01$) and positively correlated with clinical adherence ($r = .35$, $p < .01$). As mentioned by Oweidat et al. (2024) in their study of EI and delivery of healthcare quality, the emotional competencies of nursing leaders are not only related to the wellbeing of nurses, but also to patient safety outcomes.

ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

4.5 Clinical Outcomes by Emotional Intelligence Tertile

The units with high-EI nursing leaders had scores that were significantly higher than the units with low-EI nursing leaders on each of the five indicators of clinical safety. The gradient between the lowest and the highest tertiles resulted in a 50.9% reduction in medication errors and a 76.8%–58.2% improvement in hand hygiene compliance. The dose-response pattern supports Hypothesis 3 and is strong evidence of a direct relationship between nursing leader EI and patient safety on the unit level.

These results are consistent with the other international literature. In the study conducted by Turjuman and Alilyyani (2023), high EI nurse managers are more likely to demonstrate transformational leadership behaviours, which are linked with better staff performance and patient outcomes relating to safety. In a similar study, Alonazi (2020) found EI was also significant in predicting the quality of work in healthcare workers during COVID-19 pandemic. Based on these findings the present study extends the findings to specific clinical safety indicators of Medication Error, Patient Fall, Pressure Ulcers, Compliance to Hand Hygiene, and Documentation Quality in a semi-urban hospital setting in District Mardan, Pakistan for the first time, thus offering empirical evidence in this particular context.

4.6 Predictors of Positive Nursing Practice Outcomes

The best two independent predictors of clinical adherence were empathy (β = .31) and self-regulation (β = .27) which accounted for 38% of the variance in the outcome variable. Then there was an additional significant, albeit less prominent, predictive contribution by social skills (β = .20). Self-awareness and motivation were not found to be important predictors in the final model. The results are in line with Hypothesis 4.

This emphasis on empathy as a predictor aligns with Alwali and Alwali (2022) who observed that empathy promotes communication, conflict resolution, and teamwork among healthcare professionals, which are all interrelated with the ability to make adherence to clinical protocols. The importance of self-regulation as a predictor is consistent with the theoretical work of Majeed and Jamshed (2020) who highlighted the ability to comprehend, control and regulate emotions as being crucial for successful nursing leadership. The findings from these show that it is important to emphasize empathy and self-regulation training, as the two most important elements of leadership development programmes using EI in this context.

Conclusion

5.1 Summary of Key findings

This study was quantitative cross sectional study which explored the relationship between EI of Nursing Leaders and Nursing Practice outcome in public and private hospital of district Mardan, Khyber Pakhtunkhwa, Pakistan. There are five main findings from the analysis.

The first results which were obtained by District Mardan nursing leaders showed moderate level of overall EQ (M = 4.35, SD = 0.85), the strong dimension was Self-Emotion Appraisal and the weakest dimension was Regulation of Emotion. Secondly, there was no difference between overall levels of job satisfaction of nursing leaders compared to staff nurses; both reported low to moderate levels of overall

ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

job satisfaction, which suggests that there is a pervasive sense of dissatisfaction with the job among the nursing workforce. Third, nursing leader EI was strongly and positively associated with staff job satisfaction and clinical adherence, and strongly and negatively associated with staff burnout and medication errors, highlighting the wide effects of nursing leader EI on nursing practice outcomes. Fourth, the clinical safety performance of units with high-EI nursing leadership was significantly better, with 50.9% fewer medication errors, and high compliance rates and documentation accuracy for hand hygiene compared to units with low-EI nursing leadership. Fifth, together, empathy and self-regulation explained 38% of the variance in clinical adherence, making these two predictors the strongest independent factors of positive nursing practice outcomes.

The findings of all four a priori research hypotheses were found to be supported with good empirical evidence and the role of nursing leader EI proved to determine the staff wellbeing and patient safety outcomes in District Mardan.

5.2 Theoretical Contributions

This study has some values to add to the current literature. It offers a baseline quantitative information regarding EI level of nursing leaders at District Mardan and brings a missing dimension to the existing literature on EI which was identified in the region. This adds to the existing evidence in the EI–nursing outcomes relationship in a new semi-urban healthcare context in Pakistan, which is complementary to and builds on the evidence in the context of the KPK region developed by Ullah et al. (2022) and Badshah et al. (2025). Additionally, this study presents a more complete picture of the effects of leader EI than most studies to date, as it considers a variety of nursing practice outcomes that are not typically assessed separately in other studies – such as medication errors, patient falls, pressure ulcers, hand hygiene compliance, and documentation accuracy – along with job satisfaction and burnout.

5.3 Practical Implications

Based on the findings of this study, there are some important practical implications for the nursing leadership in District Mardan and KPK in general.

The study offers empirical evidence to support the value of investing in EI for leadership development programmes focused on nursing leaders for hospital administrators and nursing superintendents. Development programmes should target the competencies of empathy and self-regulation in particular, as these were the strongest correlates of positive outcomes, and the weakest area of EI identified was regulation of emotion. Similar interventions, including reflective practice groups, emotional regulation workshops, and mentorship programs, have been shown to have a positive impact on enhancing EI-related skills among nursing leaders in similar contexts (Turjuman & Alilyyani, 2023).

The KPK Health Department discovered that nursing staff and leaders had lower to moderate levels of job satisfaction, suggesting a need for systemic policy interventions related to compensation, workload, scheduling, and recognition. These structural factors seem to affect job satisfaction even when people have low or high levels of EI and are a concern at the population level that can't be solved by leadership development.

The findings support the integration of EI development to pre-registration and post-registration nursing education programs, as suggested by Bibi et al. (2025) who have shown that there was a significant

ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

relationship between EI and academic achievements of the undergraduate nursing students in Pakistan.

5.4 Limitations

A few restrictions of the present study should be noted. First, the cross sectional design does not allow causal inferences to be made – the correlational results indicate association, but do not imply causation or that other unmeasured confounding variables have not had an impact. To determine causal relationships between nursing leader EI and practice outcomes, a longitudinal study design would be necessary. Secondly, the clinical outcomes data were self-reported by nursing staff and not derived from hospital record, so there was a risk of social desirability bias and recall error, including for the frequency of adverse events over 3 months. Future research should aim to complement the self-reported results with objective administrative data in order to establish a triangulation. Third, the study was conducted only in District Mardan and results of the study may not be generalizable to other districts of KPK or other provinces of Pakistan, as they could vary in healthcare infrastructure, staffing norms and cultural context. Fourth, the relatively small number of nursing leaders (n = 39) that were available may be representative of the available sample, but it is not sufficient to provide enough statistical power for subgroup analyses. Fifth, EI of staff nurses was not evaluated, and thus, the potential moderating or mediating effect of staff nurse EI on the relationship of leader EI and outcomes was not examined.

The author recommends that further studies be conducted in the future:

Given the above limitations, the following suggestions for future studies are offered. Further research is required to find causal relationships and determine effectiveness, through the implementation of longitudinal and experimental designs, especially randomized controlled trials of EI-based leadership development interventions. Multi-district and multi-provincial studies would enable regional variations to be explored in nursing leader EI and determinants across Pakistan. Objective administrative adverse event and clinical outcome data should be added to the self-reported data in future studies. Investigating the moderator or mediator of the leader EI–outcomes relationship for staff nurse EI is warranted. Finally, the qualitative research component to explore nursing leaders experiences of emotional intelligence in a clinical context would lend context to an evidence base set by this study and related studies.

Conflicts of interest

The authors have no conflict of interest to declare with regard to the research, authorship or publication of this article.

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Author Contributions

Shabir Muhammad: Conceptualization, Methodology, Data Collection, Formal Analysis, Writing – Original Draft, Writing – Review and Editing, Project Administration.

Muhammad Ishaq: Supervision, Conceptualization, writing – Review and Editing.

Muhammad Hilal: Data Collection, Resources, Writing – Review and Editing.

ISSN 2773-7705
Periodo. Julio - Diciembre 2026
Vol. 14, Nro. 1, Publicado 2026-06-30

Huzefa Amir: Data Collection, Resources, Writing – Review and Editing.
Abdur Rahman: Supervision, Writing – Review and Editing, Corresponding Author responsibilities.

Ethical Approval

The procedures of this study were carried out in compliance with the declaration of Helsinki. The study was approved by the Institutional Review Board (IRB) of Elizabeth Rani College of Nursing and Allied Health Sciences, Mardan, Khyber Pakhtunkhwa, Pakistan (Approval No. ERCON/IRB/2025/07).

Data Availability Statement

The data underlying this article cannot be shared publicly because it contains potentially identifying information about participants and should only be disclosed with their written informed consent.Data that support the findings of this study are available from the corresponding author upon reasonable request, subject to ethical restrictions. The Raw data of the participants cannot be shared freely to ensure the confidentiality and anonymity of the participants as approved by the Institutional Review Board of Elizabeth Rani College of Nursing and Allied Health Sciences, Mardan under approval No ERCON/IRB/2025/07.

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