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The relationship between spiritual and emotional intelligence and pain tolerance in orthopedic surgery patients in Baghdad, Iraq

Arefe Fattah [1], Eman Al-Awabdeh [2], Alaa Jawad Kadhim [3], Masoome Ghotbi [4], Richard Mottershead [5], Hamid Reza Khosravizade Tabasi [6], Erfan Rajabi [7]*, Hadi Ahmadi Chenari [8]*

1. Department of Physical Therapy, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
2. Department of Nursing, Fatima College of Health Sciences. Abu Dhabi, United Arab Emirates
3. Department of Adult Nursing, College of Nursing, University of Baghdad, Baghdad, Iraq
4. Department of Emergency, Hazrat Rasul Hospital of Ferdows, Birjand University of Medical Sciences, Birjand, Iran
5. Sakina, Behavioural Science Institute, SEHA, Al Ain, United Arab Emirates. College of Nursing, University of Baghdad, Baghdad, Iraq
6. Department of Nursing, Tabas School of Nursing, Birjand University of Medical Sciences, Birjand, Iran
7. Student Research Committee, School of Allied Medical Sciences, Iran University of Medical Sciences, Tehran, Iran
8. Department of Nursing, Ferdows Faculty of Medical Sciences, Birjand University of Medical Sciences, Birjand, Iran

* Correspondence: Erfan Rajabi. Student Research Committee, School of Allied Medical Sciences, Iran University of Medical Sciences, Tehran, Iran. Tel: +989198897550; Email: erfan.rjbi@gmail.com and Hadi Ahmadi Chenari. Department of Nursing, Ferdows Faculty of Medical Sciences, Birjand University of Medical Sciences, Birjand, Iran. Tel: +985632720117; Email: ahmadi.h@bums.ac.ir

Abstract

Background: Postoperative orthopedic pain is challenging; inadequate control prolongs hospitalization and increases costs. The present study examined the relationship between spiritual intelligence and emotional intelligence and pain tolerance.

Methods: This cross-sectional, analytical study was conducted on 170 orthopedic surgery patients at Baghdad Teaching Hospital in 2023. Participants were recruited through convenience sampling. Data were collected using the King's Spiritual Intelligence Questionnaire, the Bar-On Emotional Quotient (EQ), and the Visual Analog Scale (VAS). Patients completed instruments two days post-surgery. Data were analyzed using SPSS 23, employing Pearson correlation coefficients, independent-samples t-test, and one-way ANOVA.

Results: Among 170 participants, the mean spiritual intelligence score was moderate (71.23±8.54), while emotional intelligence was low (184.25±17.3). Pain severity was high, with a mean score of 6.22 ± 0.73. Pearson's correlation coefficient showed a strong negative association between spiritual intelligence ($r = -0.62$, $p = 0.012$) and emotional intelligence ($r = -0.86$, $p = 0.01$) and pain, with the relationship being stronger for emotional intelligence. Additionally, there was a positive relationship between the demographic variables of age ($r = 0.84$, $p = 0.02$) and the presence of comorbidity ($t = 0.45$, $p = 0.03$) with higher pain scores. Variables identified as determinants by the linear regression model included emotional intelligence (b=0.61, P<0.001), spiritual intelligence (b=0.98, P<0.001), age (b=0.17, P=0.02), and comorbidity (b=0.28, P=0.004).

Conclusion: Spiritual and emotional intelligence reduce pain and improve tolerance, with stronger effects observed for emotional intelligence. Strengthening emotional intelligence among patients is essential. Nursing strategies should include training programs to enhance emotional intelligence skills, such as stress management and effective communication, to better equip patients in coping with pain.

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Highlights

What is current knowledge?

Psychological factors, such as spiritual intelligence and emotional intelligence, are known to influence patients' pain perception and tolerance. While some studies have investigated the relationship between one of these intelligences and pain, limited research has concurrently examined and compared the influence of both variables, particularly in the context of post-operative pain for orthopedic surgery patients.

What is new here?

This study simultaneously investigated both spiritual and emotional intelligence in orthopedic surgery patients in Baghdad. The findings revealed that although both intelligences have a strong negative correlation with pain levels, emotional intelligence demonstrates a more robust association with pain tolerance than spiritual intelligence. This suggests that enhancing emotional intelligence could be a more impactful non-pharmacological strategy for managing post-operative pain in this patient population.

Introduction

Pain is among the most complex processes in the human body, encompassing various physical and psychological dimensions (1). Inadequate pain control prolongs hospital stay and imposes higher medical costs (2). More than one-third of emergency department visits and 25% of patients hospitalized in teaching hospitals complain of moderate to severe pain (3).

There are many treatments available to alleviate pain. Medication is not the only means of relief; other approaches depend on the causes and types of pain (4). One effective way to manage pain and anxiety during various medical procedures is through non-pharmacological techniques. These techniques aim to reduce the perception of pain and anxiety using psychological methods (3).

One psychological variable that may be associated with the level of pain perception is spiritual intelligence (5). Spirituality can be considered a form of intelligence because it predicts one's performance and adaptability and suggests problem-solving capabilities (6,7). Individuals with high spiritual intelligence are those whose spirituality is effective (8). It has been shown that spiritual intelligence lowers the incidence of disease and increases lifespan (9-12). It also appears that

spirituality can raise the morale of individuals with chronic pain by strengthening resilience (13). Research has also demonstrated that engagement in spiritual activities, such as meditation and prayer before cesarean section, reduces pain, nausea, and postsurgical vomiting (14).

Another factor that may affect pain control and tolerance is the level of stress and anxiety, which is correlated with emotional intelligence. The term "emotional intelligence" was first introduced by psychologists John Mayer and Peter Salovey in the 1990s (15), who posited that individuals with high emotional intelligence can manage their own emotions as well as those of others (16). Emotional intelligence comprises two dimensions: coping with one's own emotions and coping with the emotions of others (17).

Numerous studies have independently investigated the correlation between spiritual intelligence or emotional intelligence and pain perception. Yazdanparast and Salami et al. (17,18) examined these variables independently. Jasemi et al. showed that improving the dimension of spiritual health as an influential factor in reducing the pain of burn patients and providing care based on culture is necessary (19).

Nevertheless, limited research has concurrently investigated both variables, particularly in surgical contexts, like orthopedic surgeries. The existing literature is insufficient and, in some cases, even contradictory, and no study was found that examined these two variables together in orthopedic patients. Moreover, given the religious and cultural contexts of Iraq, where spirituality is profoundly integrated into patients' perspectives, understanding the combined influence of spiritual and emotional intelligence on pain tolerance may offer a culturally pertinent strategy for non-pharmacological pain management. This work enhances the knowledge base by addressing a research gap and providing insights for future patient-centered care initiatives in orthopedic contexts. Therefore, we conducted this study with the assumption that both variables have an effect on pain tolerance, positing that the role of emotional intelligence is greater in influencing pain tolerance.

Methods

This cross-sectional analytical study was conducted in the second half of 2023 in the surgical department of Baghdad Teaching Hospital in Baghdad, Iraq.

Participants and sampling

The study population consisted of patients who had undergone orthopedic surgery. The patients were recruited after their orthopedic surgery during hospitalization in the surgical ward. The inclusion criteria were as follows: patients aged between 18 and 65 years, who had undergone orthopedic surgery within the past 48 hours, were conscious and able to communicate, and were not taking herbal supplements, narcotics, or strong painkillers. Exclusion criteria included having a history of addiction or known psychiatric disorders, unwillingness to continue participation, mortality during hospitalization, lack of pain perception at the time of data collection, or incomplete responses to the questionnaires. The samples were selected using a convenience sampling method based on the inclusion criteria. Based on previous studies and the observed correlation between the study variables (r = 0.28) (20), with a two-tailed significance level of 0.05 and a statistical power of 90%, the required sample size was estimated to be approximately 130 participants according to Fisher's formula.

$$3 + \left(\frac{\beta_{-1} Z_{\alpha/2-1} + Z}{\ln\left((1+r)/(1-r)\right) \cdot 0.5} \right)^2 = n$$

However, to increase precision and account for a probability of sample attrition of 20% or incomplete questionnaire data, the final target sample size was set at 178. Ultimately, 170 patients completed the study, and eight patients were excluded: five participants had emergency conditions or died, and three research units were unwilling to continue participating in the study.

Data collection

Data were collected using three instruments: a demographic and clinical characteristics form, the King's Spiritual Intelligence Questionnaire, and the Bar-On Emotional Intelligence Questionnaire. The demographic form included variables, such as age, sex, education level, comorbidities, type of surgery, and duration of hospitalization.

The King Spiritual Intelligence Questionnaire consists of 24 items measuring four subscales: critical existential thinking, personal meaning production, transcendental awareness, and expansion of the state of consciousness. Items are rated on a five-point Likert scale ranging from "completely false" (0) to "completely true" (4), with higher scores indicating higher levels of spiritual intelligence (20). The reliability of this scale has been reported as 0.88 by Salma Obaid Mohammed in a study in Iraq (21) using Cronbach's alpha, and its validity has been confirmed by them using a content validity approach.

The Bar-On Emotional Intelligence Questionnaire includes 90 items and evaluates 15 subscales across five main dimensions: intrapersonal, interpersonal, stress management, adaptability, and general mood. Responses are recorded on a five-point Likert scale from "completely disagree" to "completely agree." Total scores range from 90 to 450. Habeb Al-Obaydi et al. (22) validated the Arabic version of this questionnaire with a Cronbach's alpha of 0.92, confirming its reliability and construct validity.

To assess pain, the Visual Analogue Scale (VAS) was employed, consisting of a 10-centimeter horizontal line representing pain intensity from 0 (No pain) to 10 (The most severe pain imaginable). The VAS has demonstrated reliability and validity in various populations, including a study in Iraq by Abdulhassan (23), which reported a reliability of 0.86 and a validity score of 0.68.

After obtaining written informed consent, participants were asked to complete the questionnaires during their hospital stay, with researchers present to assist if needed. The time for patients to fill out the questionnaire and pain scale was set for two days after surgery, as they were often confused and sometimes had a lower level of consciousness on the first day. Additionally, patients could be discharged in the days following the second day.

Data analysis

Data analysis was performed using SPSS 23. Descriptive statistics, such as means, standard deviations, and frequency distributions, were used to describe the data. The normality of the data was checked using the Kolmogorov-Smirnov test, and since all data were found to be normal, parametric tests were employed. Inferential statistics included independent-samples t-tests and one-way ANOVA. To identify the key demographic and occupational predictors, a multiple linear regression analysis was conducted using the enter method. The model included age, emotional intelligence, spiritual intelligence, gender, comorbidity, length of hospitalization, and education level as independent variables, with the total pain score as the dependent variable. The assumptions of linearity, independence, homoscedasticity, and absence of multicollinearity (All VIFs < 2.0) were satisfied. The model's fit was interpreted using the adjusted R^2 value, and the significance of individual predictors was assessed at $p < 0.05$. The results are presented as unstandardized (B) and standardized (Beta) coefficients, along with their 95% confidence intervals and p-values. A p-value of less than 0.05 was considered statistically significant.

Results

In the present study, 170 patients with a mean (Standard deviation) age of 39.08 (1.95) years participated, of whom 52.4% (n=89) were male and 47.6% (n=81) were female. The majority of participants, 61.8% (n=105), had comorbidities. Regarding the length of hospitalization, 34.1% (n=58) were hospitalized for two days or fewer, 42.9% (n=73) were hospitalized for between 2 and 5 days, and the remaining patients were hospitalized for more than 5 days. In terms of educational level, 52.4% (n=74) had a high school diploma (Table 1).

There was moderate spiritual intelligence (71.23±8.54) but low emotional intelligence (184.25±17.3) among participants. Patients reported severe pain (Mean score: 6.22±0.73) (Table 2).

Pearson's correlation coefficient showed a significant negative relationship between pain and both spiritual intelligence (r = -0.62, p = 0.012) and emotional intelligence (r = -0.86, p = 0.01). The relationship with pain was stronger for emotional intelligence.

Moreover, Pearson's correlation coefficient showed a moderate, positive, and statistically significant relationship between spiritual intelligence and emotional intelligence (r = 0.58, p = 0.018).

An analysis of the demographic and clinical variables revealed that age had a strong, positive correlation with pain (r = 0.84, p= 0.02). The presence of a comorbidity was also significantly associated with higher

pain scores (t = 0.45, p= 0.03). Conversely, no significant relationship was found between pain and other demographic variables, such as gender or length of hospitalization. Furthermore, age was found to be significantly and positively correlated with both emotional intelligence (r = 0.78, p= 0.035) and spiritual intelligence (r = 0.72, p= 0.04) (Table 3).

Variables identified as determinants by the linear regression model included emotional intelligence (b=0.61, P<0.001), spiritual intelligence (b=0.98, P<0.001), age (b=0.17, P=0.02), and comorbidity (b=0.28, P=0.004). Gender, length of hospitalization, and education level were not significant in the model (P<0.05) (Table 4).

Table 1. Participants' demographic information (n=170)

Variable		Frequency	Percentage
Gender	Male	89	52.4
	Female	81	47.6
Comorbidity	Yes	105	61.8
	No	65	38.2
Length of hospitalization (Day)	< 2	58	34.1
	2 - 5	73	42.9
	> 5	39	22.9
Education level	Below diploma	74	27.6
	Diploma	89	52.4
	Academic	34	20.0
Age (Year)	Mean ± standard deviation	1.95 ± 39.08	

Table 2. Mean scores of pain, spiritual intelligence, and emotional intelligence (n=170)

Variable		Minimum	Maximum	Mean± SD
Pain score		0	10	6.22±0.73
Spiritual intelligence	Critical existential thinking	4	26	21.33±3.45
	Personal meaning Production	1	22	14.25±2.85
	Transcendental awareness	3	26	19.15±23.28
	Conscious state expansion	4	20	16.50±2.68
	Total	16	94	71.23±9.85
Emotional intelligence	Intrapersonal	36	124	54.75±14.35
	Interpersonal	26	84	39.23±11.33
	Stress management	21	56	27.23±6.25
	Adaptability	26	88	37.25±5.75
	General mood	22	54	25.75±6.75
	Total score	110	386	184.25±17.3

Table 3. Relationship between demographic information and pain in orthopedic surgery patients (n=170)

Variable	Emotional intelligence	Spiritual intelligence	Pain
Gender *	t = 1.28 p = 0.78	t = 1.17 p = 0.67	t = 0.74 p = 0. 48
Comorbidity *	t = 0.63 p = 0.72	t = 0.76 p = 0.88	t = 0.45 p = 0.03
Length of hospitalization * *	F = 0.48 p = 0.65	F = 0.85 p = 0.77	F = 0.58 p = 0.10
Age* **	p = 0.035 r = –0.78	p = 0.04 r = 0.72	p =0.02 r = 0.84

* Independent-samples t-test, * *One-way ANOVA, * ** Pearson's correlation coefficient

Table 4. Linear regression analysis of pain tolerance in 170 orthopedic surgery patients

Predictor	β	SE	95% CI	p-value
Emotional intelligence	0.61	0.001	[0.609, 0.611]	< 0.001
Spiritual intelligence	0.98	0.005	[0.971, 0.989]	< 0.001
Gender	0.02	0.011	[-0.001, 0.041]	0.680
Comorbidity	0.28	0.019	[0.243, 0.317]	0.0040
Length of hospitalization	0.009	0.012	[-0.013, 0.031]	0.580
Age	0.17	0.007	[0.156, 0.184]	0.0200
Education level	0.001	0.0005	[-0.0002, 0.0016]	0.840

Discussion

In the current study, patients undergoing orthopedic surgery indicated a significant level of pain severity. Spiritual intelligence was at a moderate level among participants, whereas emotional intelligence was predominantly poor. A substantial negative connection was identified between spiritual and emotional intelligence and pain intensity, suggesting that elevated levels of these psychological attributes corresponded with increased pain tolerance. The correlation between emotional intelligence and pain was more pronounced than that of spiritual intelligence. Furthermore, specific demographic and clinical factors, including age and the presence of comorbidities, exhibited a positive correlation with pain severity, although no significant association was identified with educational attainment or length of hospitalization.

Salami demonstrated that higher emotional intelligence allows patients to show greater resistance to stress despite facing various difficulties and challenges, as these individuals effectively assess their mental and emotional states and know how to control their emotions (18). In line with the present study, Jasemi et al. showed that emotional efficacy-based therapy had a significant effect on reducing pain, alleviating anxiety symptoms, and improving pain acceptance in both the post-test and follow-up (19). Abdulhassan et al. found in Turkish hospitals that there is a significant and positive correlation between the fear of pain and patients' emotional intelligence. Female patients reported significantly greater fear of pain and higher scores on both the fear of pain questionnaire and the emotional intelligence scale (23). Ghadrnezhad et al. found that pain management self-efficacy had no significant relationship with nurses' emotional intelligence (24,25). Additionally, a study by Marwan Rasmi Issa et al. conducted in six public hospitals in Saudi Arabia in 2022 demonstrated a positive and significant relationship between nurses' emotional intelligence and their pain management awareness (26). Among the differences with the present study is that these studies examined the emotional intelligence of nurses and its relationship with pain management, while the present study focused on patients' emotional intelligence and its significant relationship with their pain. Further research by Kang and Jung (2019) on the relationship between emotional intelligence and control over urology-related pain revealed a strong correlation between high patient levels of emotional intelligence and low levels of pain (27).

Another primary finding was that spiritual intelligence was at a moderate level. The results showed a strong negative relationship between spiritual intelligence and pain; however, this relationship was weaker than that of emotional intelligence. Similarly, Yazdanparast et al. found a significant and negative relationship between spiritual health and pain intensity (17). In 2018, Saeedi Graghani et al. showed that the mediating role of death anxiety and optimism in the relationship between subjective intelligence, hardiness, and pain perception was statistically significant. They also showed that spiritual intelligence and hardiness play an important role in reducing pain perception in patients with chronic diseases through improving optimism and reducing death anxiety (28).

It can be argued that spirituality therapy, which emphasizes the meaning of suffering and life, can reduce pain. According to Rababa, spiritual intelligence appeals to the reasons and motivations for behavior. One's determination to add meaning to life ensures one's mental health (29). Therefore, reinforcing the spiritual dimension of health is essential as an effective factor in reducing patients' pain.

Utilizing the Lazarus and Folkman stress coping model is also effective in managing emotional intelligence in the patients of this study, as the Lazarus and Folkman coping model is a psychological framework that examines the different ways people deal with stressful situations. The model identifies emotion-focused coping, which involves attempts to manage the emotions caused by the stress (30).

This study had a few limitations. First, data collection relied on self-report surveys, which are susceptible to response bias. Second, psychological characteristics, including spiritual and emotional intelligence, are influenced by cultural, religious, and personal factors that can vary significantly among individuals and contexts. Additionally, data collection was conducted in only one hospital, which may affect the generalizability of the findings; therefore, the context of the study environment should be considered when interpreting the results.

Notwithstanding these constraints, the results unequivocally endorse the primary research inquiry: both spiritual and emotional intelligence exhibit a significant correlation with pain tolerance, with emotional intelligence demonstrating a more robust association. These findings highlight the necessity of incorporating psychological factors into post-operative pain management and establish a basis for future therapies designed to bolster patients' emotional and spiritual coping mechanisms to enhance recovery outcomes.

Conclusion

There is a substantial correlation between spiritual and emotional intelligence and pain tolerance in individuals undergoing orthopedic surgery. Emotional intelligence exhibits a more pronounced negative connection with pain intensity than spiritual intelligence, suggesting that individuals with elevated emotional intelligence experience lower levels of perceived pain. These findings underscore the psychological aspects of pain and their significance in post-operative recovery.

Considering that emotional intelligence can be cultivated and enhanced through training, healthcare providers and clinical teams might implement specific interventions-such as emotional regulation workshops, stress management programs, and resilience-building techniques-to improve patients' emotional intelligence. This may enhance pain management, decrease medication consumption, shorten hospitalizations, and improve overall patient outcomes. Future investigations are advised to examine these correlations in larger and more heterogeneous patient cohorts, encompassing additional surgical procedures and chronic pain disorders. Longitudinal studies may also assess the impact of emotional intelligence training over time.

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Ethical statement

The study protocol was reviewed and approved by the Ethics Committee of the College of Nursing at the University of Baghdad, Baghdad, Iraq: IQ. UoB, CoN. REAC.18843#. 04. 9.2.2024. The research was conducted in accordance with the ethical principles outlined in the World Medical Association's Declaration of Helsinki. Written informed consent was obtained from all participants prior to their inclusion in the study. Participants were informed of the study's purpose, their right to withdraw at any time without consequence, and the confidential and anonymous handling of their data.

Conflicts of interest

The authors declared no conflicts of interest.

Author contributions

HAC and ER: Conceptualization, Methodology, Supervision, Project administration, Writing, Review, and Editing. AJK: Investigation, Data curation, and Project administration. AF: Conceptualization, Formal analysis, and Writing of the original draft. MG, EA, RM and HRKT: Validation, Writing, Review, and Editing. All authors read and approved the final version of the manuscript for publication.

Data availability statement

Data will be made available upon reasonable request, subject to review by the research team and consideration of data confidentiality.

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