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The mediating role of moral courage in the relationship between ethical leadership and error reporting behavior among nurses in Saudi Arabia: a structural equation modeling approach

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Abstract

Background Ethical leadership in nursing is pivotal for fostering a transparent workplace culture and encouraging error reporting, a critical behavior for enhancing patient safety. In Saudi Arabia, cultural and organizational factors may influence nurses' willingness to report errors, making this an essential area of study. This study investigates the correlation between ethical leadership and error reporting behavior, emphasizing the mediating influence of moral courage among nurses in Saudi Arabia.

Methods This cross-sectional research used a simple random sampling technique to recruit 269 clinical nurses from four specialized medical centers affiliated with King Abdullah Medical City in Makkah, Saudi Arabia. Data was collected between October and December 2024 using online self-reported questionnaires that included validated scales for ethical leadership, moral courage, error reporting, and demographic information form. This study was conducted in accordance with the STROBE guidelines. Structural equation modeling was used to investigate hypothesized relationships.

Results Ethical leadership significantly impacted error reporting behavior ($\beta = 0.58$, $p < 0.001$) and ethical courage ($\beta = 0.35$, $p < 0.001$). Moral courage was a significant predictor of error reporting behavior ($\beta = 0.30$, $p = 0.01$) and partially mediates the link between ethical leadership and error reporting ($\beta = 0.11$, $p = 0.01$). The total effect of ethical leadership on error reporting behavior was substantial ($\beta = 0.69$), with a BC 95% CI of (0.51, 0.89).

Conclusions The findings highlight the critical role of ethical leadership in fostering moral courage and promoting error reporting behavior among nurses. The mediation effect of moral courage underscores the importance of cultivating an ethical work environment that empowers nurses to act with integrity and report errors without fear of retaliation. These insights emphasize the need for nursing managers to prioritize ethical leadership practices and

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create transparent workplace cultures that enhance patient safety. By addressing cultural and organizational barriers, healthcare institutions in Saudi Arabia can further encourage error reporting, ultimately improving the quality of care and patient outcomes.

Keywords Courage, Leadership, Organizational culture, Patient safety, Saudi Arabia

Introduction

Globally, error underreporting continues to harm patient safety and obstruct healthcare advancement, leading to avoidable injury, reduced organizational learning, and diminished confidence in care systems [1]. As frontline healthcare providers, nurses encounter many obstacles when it comes to reporting errors, such as blame-oriented cultures, reputational damage, and fear of punishment [2, 3]. To overcome these obstacles, it is essential to develop a deeper understanding of the interplay between organizational culture, individual courage, and leadership strategies.

Ethical leadership, defined by justice, transparency, and ethical role modeling, promotes psychological safety and open communication, allowing nurses to disclose errors without fear of retribution [4, 5]. Lee and Dahinten revealed that inclusive leadership by nursing managers encourages speaking-up behaviors, improves nurses' psychological safety, and increases error-reporting intents, while decreasing silence [6]. Similarly, Ghasemi et al. also emphasized the impact of an ethical workplace atmosphere, fostered by leadership, on enhancing error reporting via trust and accountability [7].

Moral courage refers to the willingness to confront ethical challenges, even when it involves personal risk [8]. This quality is strengthened by ethical leadership, which empowers nurses to prioritize patient safety over concerns about retaliation [9]. While moral courage is not an innate trait, it can be cultivated through specific leadership behaviors, such as ethical leadership that emphasizes fairness, transparency, and role modeling, as well as through intentional organizational practices such as fostering a positive, collaborative environment, ensuring that hierarchy does not inhibit nurses' ability to speak up, and encouraging open discussions on ethical challenges, training programs, and establishment of non-punitive error reporting systems [2, 10–12]. These initiatives allow nurses to address ethical concerns, cultivate a culture of responsibility and psychological safety, which are critical for improving patient outcomes and organizational learning. Recent studies highlight the significance of moral courage in connecting ethical leadership with error reporting. They suggest that nurses who possess greater moral courage view error reporting as an ethical duty essential for driving systemic improvements [13].

This study aims to examine the connection between ethical style of leadership and error-reporting behavior, emphasizing the mediation effect of moral courage in nursing context. While ethical leadership is established as a predictor of error reporting, the mediating function of moral courage in this context remains inadequately explored. By investigating how ethical leadership and moral courage jointly impact the likelihood of error reporting, this study aims to provide a comprehensive understanding of these dynamics. Additionally, it will offer evidence-based insights that can assist healthcare administrators in creating ethical environments that empower nurses to report errors without the fear of retaliation.

Literature review and hypothesis development

Ethical leadership in nursing

Ethical leadership is characterized by the exhibition of normatively appropriate behavior through individual actions and interpersonal relationships, alongside the encouragement of such behavior in followers via two-way interaction, reinforcement, and decision-making [4]. In nursing, this form of leadership is essential for creating a culture rooted in ethical principles, as well as fostering accountability and trust. Empirical evidence links ethical leadership to job satisfaction, organizational productivity, and psychological empowerment [14–16]. Additionally, ethical leaders mitigate moral distress and foster environments conducive to ethical decision-making [17].

Ethical leadership and error reporting

Ethical leadership had important role in promoting error reporting and a culture of safety within nursing [16]. This type of leadership increases psychological safety, develops trust, and confirms organizational justice, which are necessary for reporting errors [5, 18]. Despite these benefits, error underreporting remains owing to punishing organizational norms; nevertheless, ethical leadership may move this emphasis toward a learning-oriented approach, establishing an atmosphere where nurses feel encouraged [3, 6]. In diverse cultural contexts, ethical leadership has been shown to significantly increase error reporting while reducing overall error rates, minimizing blame-oriented cultures, and enhance proactive error control. For instance, studies in Iran and Egypt have demonstrated that ethical leadership improves error reporting by fostering supportive and transparent work environments [1, 5, 7]. In China, Zhang et al. found that ethical leadership positively influenced ethical climate, which in turn enhanced both nurses' role-prescribed service behavior and extra-role service behavior [19].

Saudi Arabia's cultural context is shaped by Islamic values, collectivism, and hierarchical social structures, which significantly influence workplace behaviors, including error reporting and leadership styles [20, 21]. In collectivist cultures, group harmony and conformity are prioritized, potentially discouraging nurses from reporting errors due to fear of disrupting team cohesion [22, 23]. Additionally, the hierarchical nature of Saudi society may lead nurses to defer to authority figures, making it challenging to voice concerns or report mistakes without explicit encouragement from leaders [24]. Ethical leadership, characterized by fairness, transparency, and accountability, can help mitigate these cultural barriers by creating an environment where nurses feel empowered to report errors without fear of punishment [1, 7]. Bandura's Social Cognitive Theory (SCT) posits that ethical leaders augment nurses' self-efficacy and act as role models, so enhancing their confidence in addressing ethical dilemmas, including error reporting [25]. This generates the hypothesis shown below:

H1 Ethical leadership will positively influence error reporting behavior among nurses.

The mediating role of moral courage

Ethical leadership is crucial in cultivating moral courage among nurses by establishing a culture based on justice, openness, and responsibility [17]. Research indicates that ethical leadership improves moral awareness and judgment, which are essential for moral behavior, and diminishes worries of reprisal, thereby enabling nurses to maintain ethical standards [5, 10]. The relationship between ethical form of leadership and moral courage can be framed within Bandura's SCT [25]. This theory emphasizes the active interplay of leadership practices, personal traits, and contextual elements. Observational learning from ethical leaders strengthens corporate ideals and moral fortitude, allowing nurses to address morally problematic situations, such as reporting prescription errors, without apprehension of retaliation.

Rest's Four-Component Model of Ethical Decision-Making enhances theoretical depth by delineating the phases of moral awareness, judgment, motivation, and action [26]. Ethical leaders cultivate moral awareness and discernment while establishing environments that facilitate the connection between motivation and ethical behavior [10]. Moral courage acts as the essential mediating factor that enables nurses to convert ethical beliefs into actions, including error reporting. A study by demonstrated that developing ethical leadership competencies can promote moral courage among nurses [27]. Moreover, Chen et al. revealed that Moral courage partially mediates the relationship between moral sensitivity and ethical behavior [28]. Afsar and Shahjehan identified trust in the leader and leader-follower value congruence as important factors interacting with ethical leadership to affect moral voice, with moral efficacy mediating this relationship [29]. Lee et al. also highlighted the role of moral efficacy as a mediator between ethical leadership and moral voice, with leader-follower value congruence serving as a boundary condition [30]. These findings underline the importance of leadership in shaping ethical behaviors. Building on these perspectives, the following hypotheses are proposed:

H2 Ethical leadership positively influences moral courage among nurses.

H3 Moral courage mediates the relationship between ethical leadership and error reporting behavior.

The researchers developed the hypothetical study model based on the previously mentioned literature review and hypothesis development, as shown in Fig. 1.

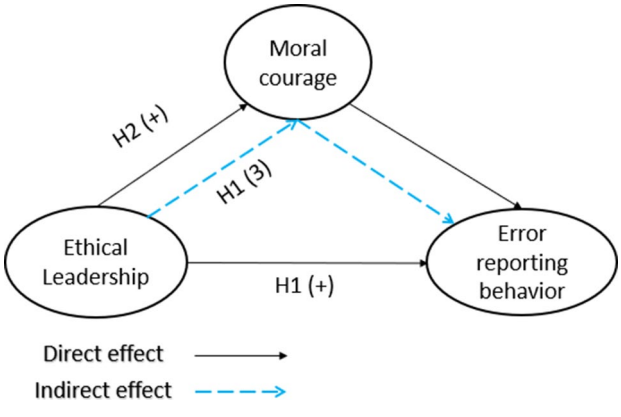

Fig. 1 The conceptual framework of the study

Methods

Study design

This research utilized a cross-sectional design, in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.

Study setting and participants

The research was conducted at King Abdullah Medical City located in Makkah, Saudi Arabia, across four specialized medical centers (cardiac, oncology, neurology, and surgery). Collectively, these centers encompass 19 inpatient units with a total capacity of 340 beds. A simple random sampling technique was used to recruit 269 clinical nurses actively involved in patient care during the data collection period. Eligible participants were required to have full-time employment and at least one year of clinical experience. Nurse managers, internship nurses, and part-time employees were excluded.

The researchers employed Soper's software for Structural Equation Modeling (SEM) for calculating sample size with the following parameters: a level of power 0.95, effect size of 0.3, a significance level of 0.05, three latent variables, and 17 observed variables [31]. This calculation indicated the least sample size of 184 nurses. To account for a 20% attrition rate, a target sample size of 221 was set. A total of 294 clinical nurses were invited to participate, resulting in 269 valid and complete responses, yielding a response rate of 91.5%.

Instruments and the study variables

The study used three scales in addition to demographic characteristics form for data collection.

Ethical leadership

The researchers utilized ethical leadership scale that was originally developed by Brown et al. to assess ethical behaviors and attributes of nurse managers from nurses' perspective [4]. The scale comprises 10 items, such as "Nurse manager has the best interests of nurses in mind." A 5-point Likert scale measured responses, varying from 1 (strongly disagree) to 5 (strongly agree). The Cronbach's alpha in this study was 0.91, while Qiu et al. reported a Cronbach's alpha of 0.96 for this scale [18].

Moral courage

The Moral Courage Scale was adapted from Mkheimer et al., for assessing nurses' willingness and ability to act ethically despite potential risks [32]. The scale comprises 4 items, such as "I would only consider joining a just or rightful cause if it is popular with my co-workers and supported by important others." The four-item scale utilized a 5-point Likert scale, where 1 represents strong disagreement and 5 indicates strong agreement. The Cronbach's alpha in this study was 0.84, while Mkheimer et al. reported a Cronbach's alpha of 0.95 for this scale [32].

Error reporting

The error reporting scale was developed by Kim and adapted from Chegini et al. to evaluate nurses' intentions to report their own or others' errors [33, 34]. This scale comprised three questions. For example, "Would you report an error that did not negatively impact patients in your current work environment?" Responses varied from 1 (never) to 5 (always). Chegini et al. reported Cronbach's alpha of 0.76, while in our study, it was 0.85 for the scale.

Demographic characteristics

The demographic characteristic form was used to collect information about participants' age, marital status, gender, nationality, education, and experience.

The researchers adhered to Beaton's guidelines for translation to ensure the cultural and linguistic equivalence of the scales from English to Arabic [35]. A panel of five experts evaluated the scales for readability, clarity, meaningfulness, and face validity, leading to necessary revisions. The content validity of the scales was assessed following Davis's guidelines, with content validity indices (CVI) for the ethical leadership, moral courage, and error reporting scales being 0.93, 0.94, and 0.92, respectively. Item-level CVI (I-CVI) exceeded 0.80 for all items, confirming their relevance and clarity [36].

Pilot study

A pilot study was carried out by the researchers involving 23 nurses who were not part of the main study. After completing the survey, participants provided feedback on clarity, applicability, and comprehensibility. The average completion time was 15 min. In the pilot study, Cronbach's values for ethical leadership, moral courage, and error reporting behavior scales were 0.89, 0.76, and 0.79, respectively, indicating reliability for the scales.

Data collection

Data collection was carried out between October and December 2024 through an online survey, which was distributed to participants via email. Additionally, a QR code linking to the survey was posted in the departments to ensure easy access for all potential respondents. The survey included a cover page explaining the study's purpose, voluntary participation, and confidentiality assurances. Mandatory response fields minimize missing data while maintaining anonymity. Participants provided informed consent before completing the survey.

Common method variance (CMV)

To assess the potential impact of common method variance (CMV), the researchers performed Harman's single-factor test using Principal Axis Factoring. The analysis revealed that the first factor explained 37.84% of the total variance, which falls well below the 50% threshold. This suggests that CMV is unlikely to pose a significant issue in this study [37]. To reduce the risk of CMV, the researchers took several preventive steps. They consulted academic experts before the study to ensure the clarity of the scale items. Additionally, the cover letter assured participants of the anonymity of their responses, as no personal identifiers were required, which helped alleviate concerns and encouraged honest participation [38].

Data analysis

The data were analyzed using IBM SPSS Statistics and AMOS, version 23.0. Descriptive statistics summarized nurse characteristics and scale responses, while Pearson correlation analysis examined relationships among

variables. A two-step approach was employed following Anderson and Gerbing's (1988) framework [39]. The first step involved Confirmatory Factor Analysis (CFA) to evaluate the measurement model's validity and reliability. The second step used Structural Equation Modeling (SEM) to evaluate both the direct effect of ethical leadership on error reporting behavior and the indirect effect through moral courage. Bootstrapping with 5,000 samples provided 95% confidence intervals for indirect effects. Model fit was assessed using Chi-square to Degrees of Freedom Ratio (χ^2/df) ≤ 3.00, Goodness-of-Fit Index (GFI) ≥ 0.90, Incremental Fit Index (IFI) ≥ 0.90, Tucker-Lewis Index (TLI) ≥ 0.90, Comparative Fit Index (CFI) ≥ 0.90, and Root Mean Square Error of Approximation (RMSEA) ≤ 0.08 [40]. All tests were two-tailed, with significance set at $p < 0.05$.

Results

Demographic characteristics of the participants

The majority of studied nurses aged between 31 and 40 years (63.6%), female (66.5%), married (68.4%), and predominantly non-Saudi (74.3%). Most participants held a bachelor's degree in nursing sciences (89.2%). Regarding professional experience, nearly half (48.3%) of the participants reported more than 10 years of experience in their field. Those with 6 to 10 years of experience made up 27.9% of the sample, while participants with 1 to 5 years of experience accounted for 23.8% (Table 1).

Table 1 Characteristics of the participants ($n = 269$)

Characteristics	*n*	%
Age (years)		
20–30	64	23.8
31–40	171	63.6
> 40	34	12.6
Gender		
Male	90	33.5
Female	179	66.5
Marital status		
Unmarried	85	31.6
Married	184	68.4
Nationality		
Saudi	69	25.7
Non-Saudi	200	74.3
Education		
Bachelor's degree	240	89.2
Technical education	29	10.8
Years of experience		
1–5	64	23.8
6–10	75	27.9
> 10	130	48.3

Measurement model (confirmatory factor analyses)

The CFA was performed to assess the measurement models. The three-factor model, which included ethical leadership, moral courage, and error reporting behavior, illustrated a better fit to the data ($\chi^2/df = 1.58$, GFI = 0.91, IFI = 0.97, TLI = 0.96, CFI = 0.97, RMSEA = 0.05) compared to the alternative models. Specifically, the two-factor model, where ethical leadership and moral courage were combined, showed a poorer fit ($\chi^2/df = 4.34$, GFI = 0.78, IFI = 0.83, TLI = 0.81, CFI = 0.83, RMSEA = 0.11). Similarly, the one-factor model, in which all study constructs were combined, exhibited the worst fit ($\chi^2/df = 6.38$, GFI = 0.72, IFI = 0.73, TLI = 0.69, CFI = 0.73, RMSEA = 0.14). These results support the distinctiveness of the core constructs in our study (Table 2).

Convergent validity was established by verifying that the factor loadings of the scale items and the average variance extracted (AVE) were greater than 0.5, while composite reliability (CR) values exceeded the threshold of 0.7 [41]. The factor loadings for ethical leadership ranged from 0.51 to 0.81, for moral courage from 0.72 to 0.83, and for error reporting behavior from 0.71 to 0.91, all surpassing the acceptable threshold of 0.5, as shown in Fig. 2. The AVE values for the constructs ranged from 0.522 to 0.661, surpassed the threshold 0.5. The CR values ranged from 0.847 to 0.915, all surpassing the 0.7 threshold, thereby confirming convergent validity.

Discriminant validity was proven by demonstrating that the square root of the AVE values exceeded the inter-correlations among the study constructs [42]. Furthermore, the Heterotrait-Monotrait ratio (HTMT) values were below the recommended threshold of 0.85 [43], fulfilling both criteria. Furthermore, the reliability of the study variables, assessed using Cronbach's alpha, exceeded 0.7 for all research variables, indicating that the

Table 2 Summary of confirmatory factor analyses ($n = 269$)

Models	χ2	df	χ2/ df	GFI	IFI	TLI	CFI	RMSEA
One factor model: EL + MC + ERB	759.614	119	6.38	0.72	0.73	0.69	0.73	0.14
Two factor model (EL + MC combined), ERB	512.32	118	4.34	0.78	0.83	0.81	0.83	0.11
Hypothesized three factor model: EL, MC, ERB	183.20	116	1.58	0.92	0.97	0.96	0.97	0.05

Note: χ2: Chi-square; df: Degrees of Freedom; χ2/ df: Chi-square to Degrees of Freedom Ratio; GFI: Goodness of Fit Index; IFI: Incremental Fit Index; TLI: Tucker-Lewis Index; CFI: Comparative Fit Index; RMSEA: Mean Root Mean Square Error of Approximation

Abbreviations: EL: Ethical leadership, MC: Moral Courage, ERB: Error Reporting Behavior

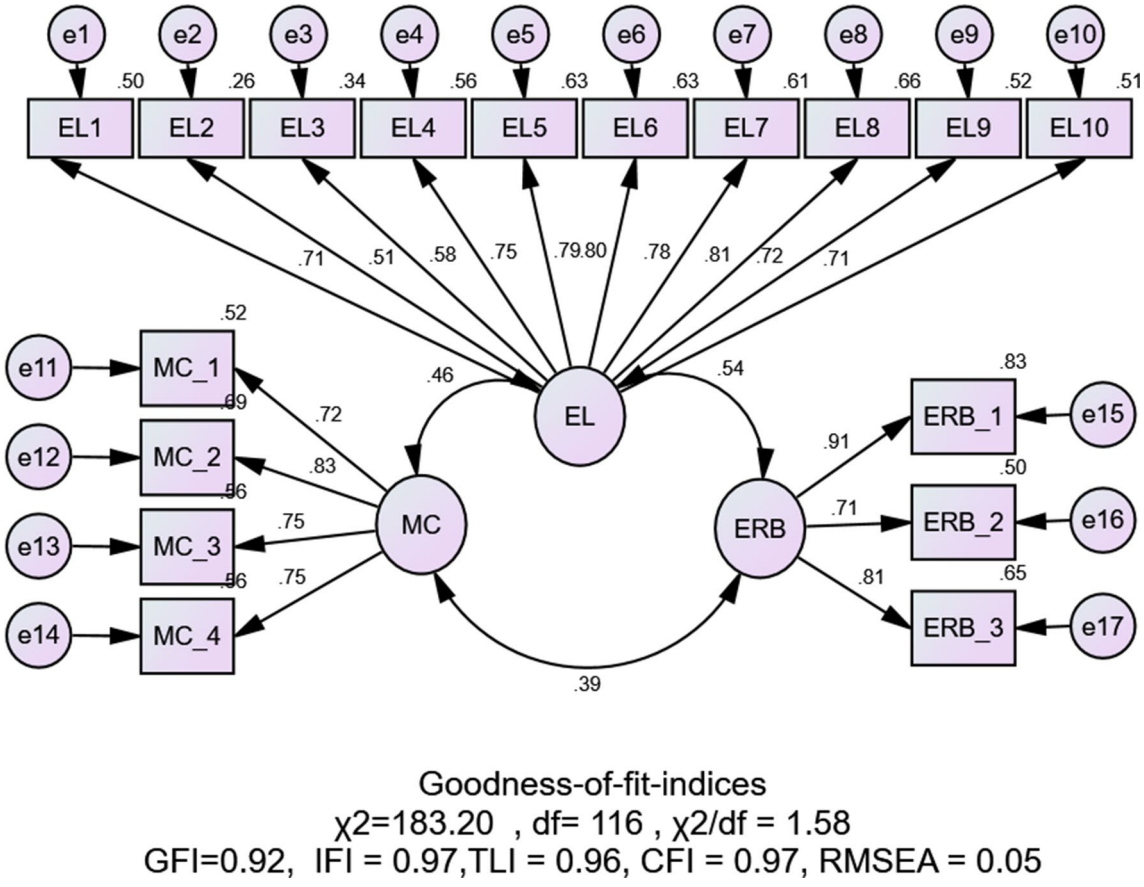

Fig. 2 Measurement model / Confirmatory factor analysis

Table 3 Descriptive statistics, reliability, validity and correlation analysis ($n = 269$)

The study variables	Mean ± SD	α	CR	AVE	MSV	1	2	3
1. EL	4.08 ± 0.59	0.91	0.915	0.522	0.293	**0.723**	*0.461*	*0.543*
2. MC	4.26 ± 0.48	0.84	0.847	0.582	0.212	0.416***	**0.763**	*0.391*
3. ERB	4.31 ± 0.65	0.85	0.853	0.661	0.293	0.487***	0.355***	**0.813**

Abbreviations: EL: Ethical leadership, MC: Moral Courage, ERB: Error Reporting Behavior

Note: AVE, average variance extracted; CR, composite reliability; SD, standard deviation. Bolded values on the diagonals represent the square root of AVE; below diagonal values are construct correlations; italics values above the diagonal represent HTMT ratio

****p* < 0.001

scales used to measure the research variables were reliable [44] (Table 3).

Descriptive statistics and correlations among the study variables

Ethical Leadership had a mean score of 4.08 ± 0.59, suggesting a favorable perception of leadership ethics. Moral Courage demonstrated a slightly higher mean score of 4.26 ± 0.48, indicating that participants perceive themselves as possessing strong moral courage in their roles. Error reporting behavior had a mean score of 4.31 ± 0.65, reflecting a positive attitude and behavior toward error reporting. ethical leadership was positively associated with moral courage ($r = 0.416$, $p < 0.001$) and error reporting behavior ($r = 0.487$, $p < 0.001$). Furthermore, moral courage was positively correlated with error reporting behavior ($r = 0.355$, $p < 0.001$) as shown in the Table 3.

Structural model (Hypotheses testing)

The Maximum likelihood estimates of the mediation model demonstrated that ethical leadership had a significant positive direct effect on error reporting behavior (β = 0.58, $p < 0.001$) (supporting H1), and moral courage (β = 0.35, $p < 0.001$) (supporting H2). additionally, moral courage significantly predicted error reporting behavior (β = 0.30, $p = 0.01$). The indirect effect of ethical leadership on error reporting behavior, mediated by moral courage, was also significant (β = 0.11, $p = 0.01$), with a BC 95% CI of (0.02, 0.21) (supporting H3). This suggests that

Table 4 Maximum likelihood estimates of the mediation model

Path coefficients	*Unstandardised coefficients*		t	*p*	BC 95%CI	
	B	SE			Lower bounds	Upper bounds
EL --> ERB	0.58	0.09	6.22	< 0.001	0.03	0.80
EL --> MC	0.35	0.06	6.29	< 0.001	0.22	0.53
MC --> ERB	0.30	0.12	2.53	0.01	0.39	0.75
Indirect effect (EL --> MC–> ERB)	0.11			0.01	0.02	0.21
Total effect	0.69				0.51	0.89

Abbreviations: BC, bias corrected; CI, confidence interval; SE, standard error. EL: Ethical leadership, MC: Moral Courage, ERB: Error Reporting Behavior

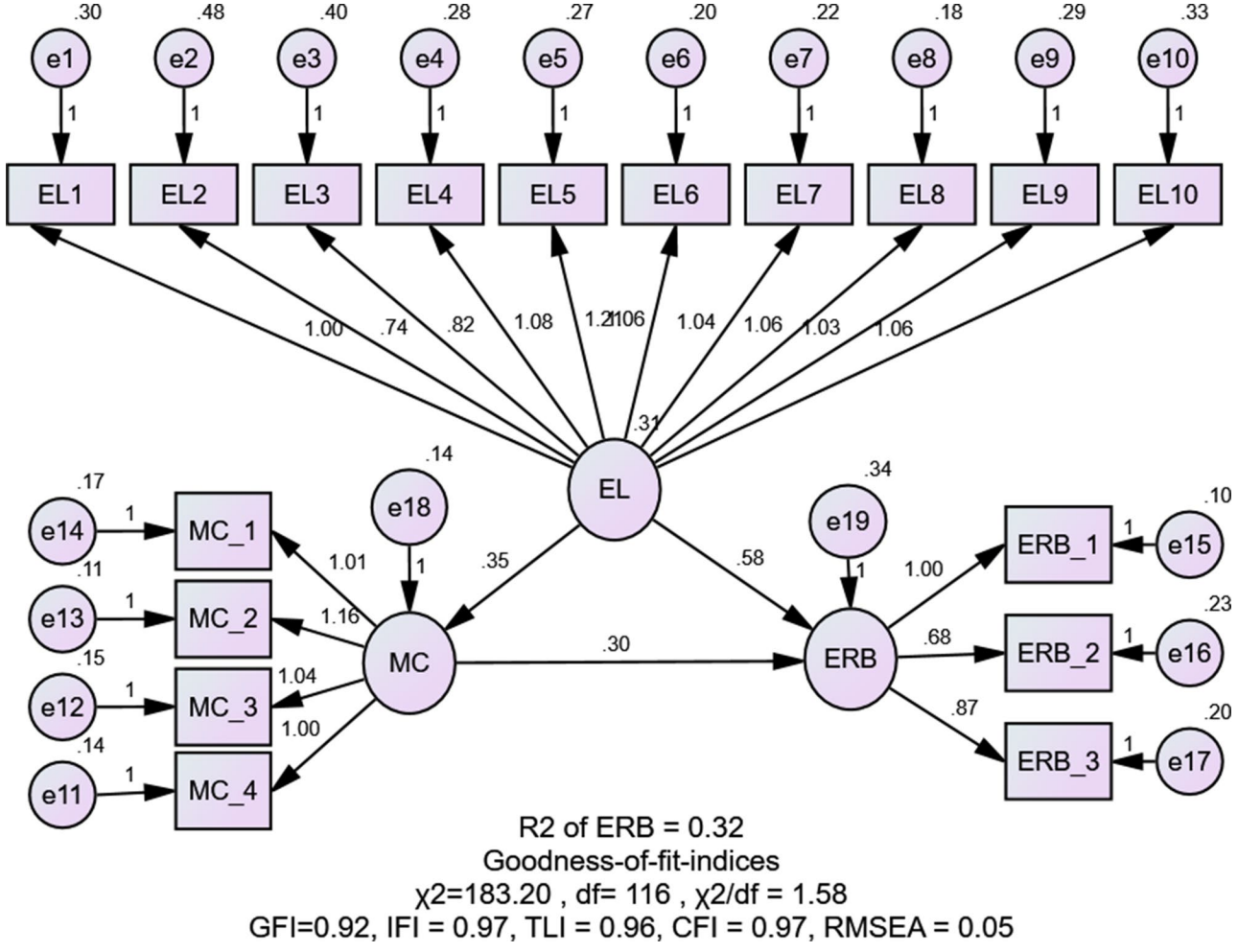

Fig. 3 The mediation model. Abbreviations: EL: Ethical leadership, MC: Moral Courage, ERB: Error Reporting Behavior

moral courage partially mediates the link between ethical style of leadership and error reporting behavior.

The total effect of ethical style of leadership on error reporting behavior was significant (β = 0.69), with a BC 95% CI of [0.51, 0.89], further confirming the robustness of the relationship. The mediation model exhibited a good fit to the data, as implied by the fit indices: χ2/df = 1.58, GFI = 0.92, IFI = 0.97, TLI = 0.96, CFI = 0.97, RMSEA = 0.05. collectively, ethical leadership and moral courage accounted for 32% of the variance in nurses' error reporting behavior (Table 4; Fig. 3).

Discussion

This study explored how ethical leadership, moral courage, and error reporting behavior are connected in the nursing profession. Our findings confirmed the hypothesized relationships, highlighting a dynamic interaction between these three important factors. This finding emphasizes the critical role of leadership in

shaping workplace behaviors, particularly those tied to ethical decision-making and patient safety, within a high-stakes healthcare environment. Notably, our study demonstrated that ethical leadership plays a key role, positively influencing both moral courage and nurses' willingness to report errors. These findings can be explained by the pivotal role of ethical leadership in fostering a supportive and principled work environment. Ethical leaders model integrity, fairness, and transparency, which not only inspire trust but also encourage employees to act in alignment with organizational and ethical standards [17]. By demonstrating and upholding ethical values, such leaders empower nurses to exhibit moral courage, as they feel supported and confident in addressing ethical dilemmas without fear of reprisal [45, 46]. Additionally, ethical leadership reduces barriers such as fear of retaliation, promoting open communication and a culture of safety [15]. This, in turn, facilitates error reporting, as nurses perceive it as a constructive act aligned with their professional responsibility and patient safety goals.

Our findings demonstrate the positive relationship between ethical leadership and moral courage among nurses. This finding is consistent with the work of Pakizekho & Barkhordari-Sharifabad, who found a similar association within Iranian hospitals [10]. Awad and Ashour further substantiated this correlation by illustrating that the perception of ethical leadership augments moral courage among nurses, especially in emergencies, so underscoring the significance of ethical leadership in difficult circumstances [27]. Furthermore, our findings correspond with those of Barkhordari-Sharifabad and Mirjalili, who revealed that ethical leadership among nursing managers correlates with decreased error rates and enhanced error reporting [1].

Chen et al. underscore the significance of a supportive work environment, hence accentuating the influence of organizational variables in facilitating error reporting [47]. Their research has shown that nurses' knowledge of reporting procedures and the existence of a supportive atmosphere substantially affect their propensity to report occurrences. Lee et al.'s systematic review study substantiates that open and supportive leaders are essential in motivating nurses to express concerns and recommendations on patient care [22]. Lotfi et al. further validate the influence of ethical leadership on comprehensive safety outcomes, recognizing nurse supervisors' ethical leadership as a determinant of a favorable patient safety culture [48].

Moreover, our results demonstrated a strong correlation between moral courage and error reporting behavior. This indicates that nurses who have the moral courage to express concerns, despite possible consequences, are more inclined to report errors. This increased tendency to report arises from their emphasis on the safety of patients and ethical responsibilities rather than personal concerns or institutional constraints. Moral courage enables nurses to surmount reluctance, promoting responsibility and nurturing a culture that prioritizes transparency and ongoing improvement via the assimilation of lessons from errors.

The results correspond with those of Yılmaz and Özbek Güven, who identified a substantial and moderate correlation between nurses' moral bravery and whistleblowing conduct, hence reinforcing the importance of moral courage in facilitating ethical reporting activities [13]. The research conducted by Gagnon et al. revealed that nurses exhibited whistleblowing actions during the first wave of COVID-19, influenced by characteristics like altered loyalty, workplace culture, distrust, and moral fortitude [49]. These results together underscore the crucial importance of moral courage in empowering healthcare personnel to behave ethically and disclose concerns, especially in difficult situations. The results of our research correspond with those of Wiisak et al., who propose that prospective whistle-blowers in healthcare often exhibit moral courage [50]. Kleemola et al. observed that moral courage empowers nurses to act on safety issues, including the possible reporting of errors [51].

It is essential to acknowledge the cultural context of Saudi Arabia, where Islamic values significantly shapes workplace behaviors [52]. In this context, ethical leadership is a critical enabler of moral courage and error reporting, as it addresses cultural barriers such as fear of retaliation and reluctance to challenge authority [53]. For instance, the emphasis on fairness and transparency in ethical leadership aligns with Islamic principles of justice and accountability, making it more acceptable for nurses to report errors without fear of punishment [10]. Future research should explore how cultural adaptation strategies, such as integrating Islamic ethical teachings into leadership training programs, can further enhance the effectiveness of ethical leadership in promoting error reporting behaviors.

Our research indicates that moral courage serves as a mediator in the association between ethical leadership and error reporting behavior among nurses. This mediating impact underscores the many paths via which leadership affects behavior. In contrast to previous research that emphasized direct connections, our results provide a comprehensive comprehension of these indirect pathways. This work enhances the current literature by addressing gaps in the understanding of the relationship between leadership, bravery, and conduct. Our results correspond with Bandura's social cognitive theory, which emphasizes the crucial influence of modeling on individual behavior. Ethical leaders serve as exemplars, showcasing principled decision-making and moral behavior in intricate circumstances. Witnessing such conduct from

esteemed and reputable leaders cultivates self-efficacy—the conviction in one's capacity to perform successfully and ethically in difficult situations [25]. Nurses get confidence to demonstrate moral bravery and participate in error reporting from seeing their bosses' dedication to ethical norms. These acts are seen as attainable and morally warranted, hence confirming their congruence with organizational and patient safety objectives.

Bandura's idea of reciprocal determinism clarifies the mediating function of moral courage in the association between ethical leadership and error reporting behavior. Reciprocal determinism highlights the dynamic interaction between environmental factors (e.g., ethical leadership), personal characteristics (e.g., moral courage), and behaviors (e.g., error reporting). In this context, ethical leadership establishes a supportive culture that encourages moral courage, empowering nurses to overcome personal and professional barriers to report errors. In turn, the behavior of error reporting reinforces the culture of safety and accountability within the organization, completing the feedback loop.

Our findings support Rest's Four-Component Model of Ethical Decision-Making, which helps explain the role of moral courage as a mediator [26]. According to the model, ethical behavior involves four key components: moral sensitivity (recognizing moral issues), moral judgment (deciding on the right action), moral motivation (prioritizing ethical values), and moral character (persisting in ethical actions). In our study, ethical leadership enhances moral sensitivity and moral motivation by fostering an environment that values ethical decision-making. Moral courage, as an expression of moral character, bridges the gap between recognizing the need to report an error and actually doing so, thus supporting patient safety. Without moral courage, nurses may refrain from reporting errors due to fear of consequences, which can undermine safety improvements. This highlights how moral courage translates ethical awareness into action, with ethical leadership fostering a culture that enables nurses to prioritize patient safety in challenging situations. Previous research, such as the study by Sultana et al. confirms that moral courage mediates the relationship between ethical leadership and employee behaviors, underscoring its role in turning ethical principles into practical actions [54].

These findings also supported by the work of Kashani et al., which underscores the importance of ethical awareness in fostering moral courage, which, in turn, enables nurses to report errors confidently and uphold patient safety [55]. Additionally, the findings of Zhang et al. highlight the mediating roles of ethical climate and moral sensitivity in the relationship between ethical leadership and nurses' service behaviors [19]. These insights complement our study, as they suggest that ethical leadership not only directly influences behavior but also operates through key mediators. Similarly, our findings propose that moral courage serves as a critical mediator in the relationship between ethical leadership and error reporting behavior, reinforcing the multifaceted pathways through which leadership impacts ethical actions in nursing context. While our research focuses on the role of ethical leadership in promoting moral courage and error reporting behaviors in nursing context, it is important to acknowledge that other leadership style, such as transformational leadership may also contribute to fostering moral courage and promoting error reporting behaviors. Transformational leadership, characterized by inspirational motivation, intellectual stimulation, and individualized consideration, has been shown to enhance nurses' psychological empowerment and willingness to engage in ethical and safety behaviors [56–58]. For instance, transformational leaders who inspire trust and encourage innovation may create an environment where nurses feel confident in reporting errors as part of their professional responsibility [59]. However, ethical leadership uniquely emphasizes fairness, transparency, and accountability, which are particularly relevant in addressing cultural barriers to error reporting in Saudi Arabia. Future research should examine the comparative effects of different leadership styles on moral courage and error reporting to identify the most effective approaches for enhancing patient safety in diverse cultural contexts.

Limitations of the study

This study has several limitations that should be acknowledged. First, its cross-sectional design prevents causal inferences, and future longitudinal research is needed to examine how these relationships develop over time. Second, the reliance on self-reported data introduces the possibility of social desirability bias, which may have influenced participants' responses. Future studies could address this limitation by incorporating mixed-method approaches or objective data sources, such as institutional error reporting records. Third, as the study was conducted within a specific cultural and organizational setting in Saudi Arabia, the generalizability of the findings may be limited. Comparative studies in different healthcare contexts would be valuable in assessing the broader applicability of these results.

Implications of the study

The study emphasizes the need for nursing managers to create an ethical, transparent workplace culture that supports error reporting without fear of retaliation, enhancing patient safety and organizational learning. Policies should focus on strengthening moral courage, while confidential, non-punitive reporting systems should be established to encourage open communication. Ethical

leadership training is also crucial, fostering qualities like integrity and transparency to improve error reporting behaviors. Additionally, ongoing professional development programs, such as workshops and case studies on ethical dilemmas, can empower nurses to navigate complex situations confidently. Finally, policymakers should incorporate ethical leadership and moral courage training into nursing education and professional development to ensure nurses are equipped with both clinical skills and ethical frameworks for high-quality, safe care.

Conclusions

This study suggests that ethical leadership is positively associated with both moral courage and error reporting behavior among nurses, indicating its potential role in fostering an ethical and transparent workplace culture. The findings also indicate that moral courage may be an important factor in influencing nurses' willingness to report errors. Furthermore, the partial mediation effect of moral courage in the relationship between ethical leadership and error reporting behavior highlights the importance of cultivating supportive environments that empower nurses to act with integrity. However, while these results provide valuable insights, further research is needed to establish causal relationships and explore additional contextual factors that may influence these associations.

Abbreviations

EL Ethical leadership
MC Moral courage
ERB Error reporting behavior

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Author contributions

IAI and EAE: Conceptualization (lead); writing – original draft (lead); formal analysis (lead); investigation (supporting); writing – review and editing (equal). IAI, MSH, and KLA: Formal analysis (supporting); conceptualization (supporting). EAE, AAH, and MA: Methodology (lead); conceptualization (supporting); writing – original draft (supporting); writing – review and editing (equal). JBA and OAA: Investigation (lead); writing – review and editing (equal). All authors have made substantial contributions to the development of the manuscript. They were involved in drafting the manuscript or revising it critically for important intellectual content. Furthermore, all authors have reviewed and approved the final version of the manuscript submitted for publication.

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Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the principles of the Declaration of Helsinki [60]. The study design was approved by the King Abdullah Medical City Institutional Review Board (IRB) (approval no. 23-1090) in Saudi Arabia. All participants were thoroughly informed about the study's purpose and provided online informed consent before participating. Responses were kept strictly confidential for research purposes only, and the results did not personally identify respondents.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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