Influencing factors of moral resilience among intern nursing students: a cross-sectional survey

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Abstract

Objective This study examines and analyses the degree of moral resilience among intern nursing students, as well as the factors that influence it. The goal is to provide a reference point for moral resilience development in nursing students and targeted interventions.

Background As nursing is constantly evolving and the healthcare system becomes more intricate, nurses are being confronted with increasingly prominent ethical and moral dilemmas within their clinical practices. One method that has been acknowledged for countering ethical distress is the cultivation of moral resilience. Moral resilience is an evolving concept that has received limited attention in previous cross-sectional research studies. As practicing nurses are instrumental in advancing the future of nursing, it is crucial to comprehend and ascertain the variables linked with moral resilience. This is vital for developing a curriculum on the subject.

Design A cross-sectional survey.

Methods Three hundred and forty-seven nursing students enrolled as interns at a teaching hospital in Zhengzhou City, Henan Province, China, were surveyed for this study. The survey included a general information questionnaire, along with the Chinese versions of the Rushton Moral Resilience Scale, the Moral Sensitivity Questionnaire-Revised, and the Moral Identity Scale.

Results The average score for moral resilience in practicing nursing students was (46.93 ± 6.07). Moral sensitivity ($r = 0.229$, $p < 0.01$), moral identity ($r = 0.541$, $p < 0.01$) were significantly and positively correlated with moral resilience. Moral identity ($\beta = 0.488$, $p < 0.001$), previous ethics courses or training ($\beta = -0.178$, $p < 0.001$), gender ($\beta = -0.132$, $p = 0.003$), and attitudes toward the nursing profession ($\beta = -0.111$, $p = 0.015$) were the predictors of moral resilience for practicing nurses, explaining a total of 34.5% of the total variance.

Conclusion The moral resilience of nursing interns is at a low level, and there is a positive correlation between moral sensitivity, moral identity and moral resilience. The moral resilience of nursing interns is primarily affected by their gender, attitude towards the profession, moral identity, whether or not they have received an ethics course.

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Impact This study emphasized that nursing educators and administrators can provide targeted interventions and training to improve the moral resilience of nursing students in order to enhance their clinical practice and post-graduation employment prospects.

Clinical trial number Not applicable.

Keywords Intern nursing students, Moral resilience, Moral identity, Moral sensitivity

Introduction

As new technologies and theories are applied in nursing practice, nursing concepts evolve and the healthcare environment becomes increasingly intricate [1]. Nurses are facing greater ethical and moral distress in their clinical work, with moral distress being one of the most significant issues [2]. Moral distress may be a significant source of psychological and emotional harm among nurse practitioners [3]. Students may be regularly confronted with conflict-ridden ethical situations during their internships, which include anxiety, death, and dying that may arise from hospitalized patients and their families [4]. Healthcare becomes increasingly complex and moral distress in nursing practice multiply, it is unfeasible to entirely remove moral distress [5]; the key is to mitigate their negative effects [6].

Moral resilience is the ability to maintain or restore integrity in response to moral distress [7]. It is a complex concept that includes six characteristics: personal integrity, relational integrity, buoyancy, self-regulation, self-stewardship, and moral efficacy [8]. Previous research has shown that moral resilience can serve as a way to combatmoral distress [5], improve nurses' psychological health [9], reduce burnout and decrease turnover rates [10]. Moral resilience has now been proposed as a strategy to mitigate moral distress among nurses [11]. Stress and potential moral distress among nursing students and its detrimental impact on their learning, well-being and ability to care reinforce the importance of developing moral resilience among nursing students to prevent moral distress [12].

Moral sensitivity refers to the awareness of moral values in conflict situations, as well as the self-awareness of the roles and responsibilities an individual undertakes [13]. In the field of nursing, nurses' moral sensitivity is reflected in their awareness of patients' vulnerability and their recognition of the moral consequences of patient-related decisions [14]. Studies have shown that nurses' moral sensitivity is positively correlated with moral resilience, which is characterized by the ability to overcome challenging situations in nursing practice and is considered a core aspect of moral sensitivity [15]. Additionally, moral identity is positively correlated with moral sensitivity, and the psychological components of moral sensitivity include intuitive emotions and moral cognition, whose interactions can also influence an individual's

moral perspectives [16]. Although previous research has explored the theoretical correlations among moral sensitivity, moral distress, and moral resilience by constructing hypothetical scenarios from the perspective of Frankl's existentialist philosophy, empirical evidence remains insufficient. Particularly, the relationships among these variables in the population of nursing students have not been thoroughly investigated [17]. Therefore, this study aims to analyze the relationship between moral sensitivity and moral resilience by surveying intern nursing students.

Moral identity can be defined as the importance of virtue to the self. It is a self-regulatory mechanism that links moral cognition and moral behaviour, and it is an important motivation for moral behaviour [18]. Moral identity implies the assimilation or fusion of one's moral and self-systems, such that the sense of morality and sense of identity reach a certain degree of unity [18]. Individuals with a high level of moral identity are more inclined to demonstrate their moral qualities and seek recognition from others [19]. They are also more sensitive to opportunities to exhibit these moral traits and more attuned to moral issues present in their surroundings [20]. As a result, they exhibit a higher degree of moral sensitivity. Prior research with adolescents has demonstrated that moral identity can predict moral behaviour and that moral identity is a significant factor influencing moral behaviour [21]. The nursing student's clinical internship phase is a crucial period in their development as a professional nurse, and the establishment of a professional nursing identity is contingent upon displaying behaviors that align with their moral identity [22]. Moral qualities such as personal integrity and relational integrity are also included in the concept of moral resilience. In order to understand the formation of professional moral identity including personal moral concepts, this study measured moral identity and explored whether it had an impact on nursing students' moral resilience.

As moral resilience is an evolving concept, there have been limited cross-sectional studies conducted primarily among healthcare workers.The development of moral resilience among student nurses is important for improving job security and building a stable, high-quality nursing team, as they are the future force in nursing. Research has shown that the stress and potential moral distress of nursing students' moral sensitivity and moral dilemmas

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can adversely affect their learning, well-being, and ability to care [23], highlighting the importance of developing moral resilience in nursing students. The cultivation of moral resilience among nursing students may facilitate their transition to clinical work. The implementation of a curriculum that promotes moral resilience could aid nursing students in navigating the complexities of nursing practice, thus reducing the incidence of burnout and turnover among clinical personnel.

This study investigated and analyzed the moral resilience level of intern nursing students and its influencing factors, aiming to provide reference for the development of moral resilience of nursing students and targeted interventions.

Methods

Research design

The research utilized a cross-sectional design to explore the moral resilience level and influencing factors in nursing students who are currently practicing. The study was conducted during the period of September through October 2022.

Participants

The study was conducted at a large tertiary hospital in Zhengzhou City, Henan Province, located in central China. This hospital receives nursing interns from approximately twenty different schools each year, with the total number of interns approaching four hundred. This study utilized convenience sampling to include nursing interns.Inclusion criteria: (a) full-time nursing students during their internship; (b) informed consent and voluntary participation in this study; exclusion criteria: (a) those who were not on duty during the survey period due to illness, vacation, or leave of absence; (b) those who withdrew during the survey period for various reasons.The sample size for this study was calculated using G*Power software, version 3.1.9.7. The calculation included 16 variables, consisting of 7 general demographic items and 9 dimensions from the scale. Assuming a significance level of 0.05, a medium effect size of 0.15, and a power of 95%, the minimum required sample size was determined to be 204 participants. Accounting for a 15% rate of invalid data, the total number of participants needed was 240. In this study, 347 nursing interns were ultimately included.

Instruments

A self-designed general information questionnaire was used to collect demographic characteristics, including seven items: gender, place of birth, single child, religion, reasons for professional choice, attitudes toward the nursing profession, and previous ethics courses or training.

The study assessed the moral resilience of nursing students using the Rushton Moral Resilience Scale (RMRS). The RMRS was developed by Heinze et al. [24] and subsequently translated and adapted into Chinese by Yang et al. [25] translated and revised the RMRS into Chinese in 2022. The 16-item scale comprises four dimensions: responses to moral adversity (4 items), moral efficacy (4 items), relational integrity (5 items), and personal integrity (3 items). Each item offers four responses ranging from "disagree" to "agree". The Likert 4-point scale was used, with scores ranging from 1 to 4. The higher the score, the stronger the moral resilience.The Cronbach's α coefficient of the original scale was 0.763, while in this study, the Cronbach's α coefficient of the scale was 0.706.

The moral sensitivity of nursing students was assessed using the revised Chinese Moral Sensitivity Questionnaire (MSQ-R-CV). Lützén et al. [13] developed this questionnaire which was then translated and revised by Huang et al. [26] for the Chinese version. The scale comprises 9 items, delineated into two dimensions: moral burden (4 items) and moral responsibility and strength (5 items). Each item is rated on a 6-point Likert scale from 1 (disagree) to 6 (agree). The total score varied between 9 and 54, with elevated scores indicating heightened ethical sensitivity.The original scale reported a Cronbach's α of 0.82, and the same scale in this study achieved a Cronbach's α of 0.835.

In this study, the Moral Identity Scale (MSQ) was employed to measure the moral identity level of nursing students. The scale was originally developed by Aquino and Reed [27], and later translated and adapted into Chinese by Wan and Yang [28]. The scale consists of two dimensions: implicit and explicit moral identity, each containing 5 items. The scale is divided into two parts: Part 1 presents a list of adjectives representing moral qualities (caring, compassionate, fair, friendly, generous, helpful, hardworking, honest, kind). Participants are asked to imagine how they would think, feel, and behave if they possessed these qualities.Part 2 includes 10 questions requiring participants to respond based on their self-perception.Responses are recorded using a 5-point Likert scale ranging from "completely disagree" (1) to "completely agree" (5). Higher scores indicate a stronger moral identity. The original scale demonstrated a Cronbach's α coefficient of 0.83, while in this study, the scale achieved a Cronbach's α of 0.798.

Data collection and ethical consideration

The investigation was carried out by the researcher with the backing and assistance of the nursing leadership in the hospital. An electronic questionnaire, created using Questionnaire Star, was used to distribute the survey. The initial page of the survey outlined the purpose and significance of the study, instructed the respondents

on how to complete the questionnaire. Confidentiality and anonymity of the responses were maintained, and informed consent from nursing interns was obtained prior to answering the questionnaire. Each IP address was restricted to one response. The research received approval from the Ethics Committee of the Second Affiliated Hospital of Zhengzhou University (2022376), and all study participants provided informed consent and participated voluntarily.

Data analysis

Data were analysed using IBM SPSS 26.0 software and count data were expressed as mean ± standard deviation, while measures were expressed as numbers and percentages. After testing the normality and homoscedasticity of the distribution, independent samples t-test and one-way ANOVA were used to assess the differences in moral resilience and its dimensions between the groups. Pearson correlation was used to analyse the correlation between moral resilience, moral sensitivity, and moral identity. Subsequently, multiple linear stepwise regression analyses that allowed statistically significant variables to enter the model sequentially were used to determine which variables had a significant effect on moral resilience. $P < 0.05$ was considered statistically significant.

Results

Demographic information of the participants

A total of 347 intern nursing students participated in this study (Table 1). The majority of them were female ($n = 277, 79.8\%$). Of these students, 263 (75.8%) were from rural areas, 39 (11.2%) nursing students were the only children in their families, and only a few ($n = 12$, 3.5%) had religious affiliation. Male nursing students had higher moral toughness scores than female nursing students ($t = 3.785, p < 0.001$). Practice nursing students with very positive attitudes toward the nursing profession scored higher on moral resilience ($F = 8.069, p << 0.001$). Nursing students with previous ethics courses or training have higher moral resilience ($t = 3.723, p < 0.001$).

Moral resilience, moral sensitivity and moral identity

Descriptive statistics are presented in Table 2.

The overall mean score of moral resilience was 46.93 ± 6.07, with an item mean score of 2.93 ± 0.38, indicating a relatively low level of moral resilience among participants. Breaking down the scores by dimension, the moral efficacy dimension had the highest item mean score (3.18 ± 0.60), followed by responses to moral adversity (3.01 ± 0.66), while the personal integrity dimension had the lowest item mean score (2.57 ± 0.47). This suggests that nursing students may struggle to maintain

Table 1 General information and univariate analysis of participants ($n = 347$)

Characteristics		N(%)	RMRS'score (Mean ± SD)	t/F	P
Gender				3.785	<0.001
	Male	70(20.0)	49.34 ± 5.26		
	Female	277(79.8)	46.32 ± 6.12		
Residence				1.269	0.205
	Rural	263(75.8)	47.17 ± 6.17		
	Urban	84(24.2)	46.20 ± 5.75		
The only child in family				−1.893	0.059
	Yes	39(11.2)	45.21 ± 6.33		
	No	308(88.8)	47.15 ± 6.02		
Religious belief				1.267	0.230
	Yes	12(3.5)	50.17 ± 9.08		
	No	335(96.5)	46.82 ± 5.93		
Reasons of studying nursing				1.293	0.277
	Voluntary Choice	191(55.0)	47.27 ± 6.43		
	Listen to others	68(19.6)	46.04 ± 5.55		
	Employment considerations	80(23.1)	47.18 ± 5.68		
	Obedient adjustment	8(2.3)	44.13 ± 4.79		
Attitude toward the nursing profession				8.069	<0.001
	Very Positive	167(48.1)	48.51 ± 6.05		
	More Positive	157(45.2)	45.65 ± 5.79		
	Uncertain	20(5.8)	44.10 ± 5.63		
	Negative	3(0.9)	45.33 ± 3.06		
Previous ethics courses and training				3.723	<0.001
	Yes	299(86.2)	47.41 ± 6.08		
	No	48(13.8)	43.96 ± 5.21		

Table 2 The score of moral resilience, moral sensitivity and moral identity (*n* = 347)

Variables	Item	Score(mean ± SD)	Items mean score
Moral resilience	16	46.93 ± 6.07	2.93 ± 0.38
Responses to moral adversity	4	12.02 ± 2.64	3.01 ± 0.66
Moral efficacy	4	12.71 ± 2.39	3.18 ± 0.60
Relational integrity	5	14.50 ± 2.93	2.90 ± 0.59
Personal integrity	3	7.70 ± 1.42	2.57 ± 0.47
Moral sensitivity	9	39.64 ± 7.51	4.40 ± 0.83
Moral responsibility and Strength	5	24.01 ± 4.62	4.80 ± 0.92
Moral burden	4	15.63 ± 4.05	3.91 ± 1.01
Moral identity	10	38.54 ± 5.69	3.85 ± 0.57
Internalization	5	19.93 ± 3.12	3.99 ± 0.62
Symbolization	5	18.62 ± 3.01	3.72 ± 0.60

personal moral standards in the face of moral dilemmas, whereas they perform relatively better in relational or collective moral challenges (2.90 ± 0.59). This highlights a potential area for intervention, as personal integrity is foundational to sustained moral resilience.

The total mean score for moral sensitivity was 39.64 ± 7.51, with an item mean score of 4.40 ± 0.83, indicating a high level of moral awareness among participants. The moral responsibility and strength dimension scored particularly high (4.80 ± 0.92), suggesting that nursing students recognize their moral obligations and feel capable of fulfilling them. The moral burden dimension scored relatively lower (3.91 ± 1.01), indicating that while participants are aware of their moral responsibilities, they do not feel excessively overwhelmed by them. This balance is crucial, as excessive moral burden can lead to burnout, while too little burden may indicate a lack of moral engagement.

The total mean score for moral identity was 38.54 ± 5.69, with an item mean score of 3.85 ± 0.57, indicating that nursing students are able to integrate moral values into their self-concept to some extent. The two sub-dimensions further clarify this: the internalization sub-dimension scored higher (3.99 ± 0.62), suggesting that nursing students deeply internalize moral values as part of their self-identity. The symbolization sub-dimension scored slightly lower (3.72 ± 0.60), indicating that

although participants value morality internally, they may be less inclined to express these values outwardly through actions or behaviors.

The relationship between moral resilience, moral sensitivity and moral identity

The correlation analysis (Table 3) revealed significant findings regarding the relationships between moral resilience, moral sensitivity, and moral identity among intern nursing students. Moral identity demonstrated the strongest correlation with moral resilience ($r = 0.541$, $p < 0.01$), indicating that students who deeply integrate moral values into their self-concept are better equipped to sustain moral resilience. Moral sensitivity showed a weaker but statistically significant correlation with moral resilience ($r = 0.229$, $p < 0.01$). Notably, this relationship was primarily driven by moral responsibility and strength ($r = 0.400$, $p < 0.01$), while moral burden exhibited no significant correlation. These results suggest that nursing students' perceived capability to act ethically (e.g., "I can uphold my values even under pressure") has a greater impact on moral resilience than their perceived burden of ethical obligations. Among the dimensions of moral resilience, relational integrity ($r = 0.369$, $p < 0.01$) and moral efficacy ($r = 0.370$, $p < 0.01$) correlated more strongly with moral identity compared to personal integrity ($r = 0.251$, $p < 0.01$). The weaker association between personal integrity and moral identity may reflect that nursing students in high-stakes clinical environments prioritize relational dynamics (e.g., team harmony) over strict adherence to personal moral standards. This analysis underscores the critical role of internalized moral values and ethical empowerment in fostering resilience, while highlighting contextual challenges in aligning personal integrity with external pressures in healthcare settings.

Multiple linear regression analysis of moral resilience

The results of the multiple stepwise linear regression analysis showed that a total of four independent variables entered the regression equation, with moral identity ($\beta = 0.488$, $p < 0.001$), previous ethics courses and training ($\beta = -0.178$, $p < 0.001$), gender (($\beta = -0.132$, $p = 0.003$), and attitude toward the nursing profession ($\beta = -0.111$, $p = 0.015$) were the influencing factors of moral resilience

Table 3 The relationship between moral resilience, moral sensitivity and moral identity (*n* = 347)

Variables	Moral sensitivity	Moral responsibility and strength	Moral burden	Moral identity	Internalization	Symbolization
Moral resilience	0.229**	0.400**	-0.032	0.541**	0.556**	0.447**
Responses to moral adversity	0.135*	0.266**	-0.053	0.365**	0.389**	0.287**
Moral efficacy	0.171**	0.276**	0.002	0.370**	0.394**	0.292**
Relational integrity	0.182**	0.332**	-0.040	0.369**	0.373**	0.311**
Personal integrity	0.065	0.068	0.043	0.251**	0.224**	0.242**

Note **means *p* < 0.01, *means *p* < 0.05

Table 4 Multiple linear regression analysis of moral resilience (*n* = 347)

Variables	Unstandardised coefficients		Standardised coefficients		P	95% confidence interval for β	
	B	SE	β	t		Lower bound	Upper bound
(Constant)	35.672	2.759	-	12.928	<0.001	30.245	41.100
Moral identity	0.521	0.049	0.488	10.691	<0.001	0.425	0.617
Previous ethics courses and training	-3.134	0.767	-0.178	-4.088	<0.001	-4.641	-1.626
Gender	-1.988	0.662	-0.132	-3.001	0.003	-3.291	-0.685
Attitude toward the nursing profession	-1.058	0.431	-0.111	-2.457	0.015	-1.905	-0.211

Note R^2 = 0.353, Adjusted R^2 = 0.345, F = 46.606, *P*<0.001

among intern nursing students, explaining a total of 34.5% of the variance, as shown in Table 4.

Discussion

Compared to clinical nurses, student nurses are younger and have less life experience because they are at an important stage of role transition related to their future career choice and development.

Transforming the concept of negative moral dilemmas in clinical work into positive adaptive behaviors is critical, and nursing educators need to help students develop skills and strategies on how to deal with moral dilemmas [29]. Thus, they will be more adaptable when they become new nurses after graduation and reduce their burnout and stress [30]. Compared to clinical nurses, student nurses are younger and have less life experience because they are at an important stage of role transition related to their future career choice and development.

The level of moral resilience of intern nursing students is relatively low

The aim of this study was to determine the level of moral resilience in student nurses and the factors that influence it. The results showed that the level of moral resilience among Chinese intern nursing students was slightly lower. Compared with previous studies, it is lower than the mean value of 702 entries of moral resilience among interprofessional healthcare workers [24]. The reason for this is that intern nurses are still out of school and have just entered the clinical setting, and their work experience and skills are insufficient, so they may not be able to respond effectively when faced with moral dilemmas, and therefore their moral resilience level is relatively low. In addition, the intern nursing students in this study had the lowest mean score on the personal integrity dimension. Personal integrity refers to the ability to "hold on to one's values in the face of adversity," and it is critical to maintain one's integrity/values in the face of challenging clinical moral distress events [8]. Scores on this dimension suggest that nurse interns need to uphold their beliefs/ confidence to care for patients. The findings of this study hold significant implications for nursing education and clinical practice. Firstly, nursing educators should

develop tailored training programs to address the lower levels of personal integrity among intern nursing students. For example, simulation training and case analysis can be utilized to help interns recognize moral dilemmas and learn adaptive coping strategies, thereby aligning their professional values with clinical behaviors. Secondly, healthcare institutions should provide additional psychological support and ethical guidance to interns, enabling them to maintain their convictions and integrity when confronting moral challenges. Finally, policymakers should consider integrating moral resilience into the professional competency evaluation system for nursing students to foster their career development.

Moral sensitivity, moral identity were positively correlated with moral resilience

The Pearson correlation analysis revealed a significant positive correlation between moral sensitivity and moral resilience among intern nursing students, indicating that higher levels of moral sensitivity are associated with higher levels of moral resilience. This finding aligns with the results of Üzar et al., who also found a positive correlation between nurses' moral sensitivity and resilience [15]. Broadly speaking, resilience is defined as "the ability to successfully bounce back or cope successfully in the face of adversity" [31]. However, moral resilience is an emerging concept that builds on the concept and research of resilience to address moral dilemmas that arise in clinical practice as the ability to transform moral dilemmas from negative experiences into hope [32]. Lack of moral sensitivity may lead nurses to ignore ethical issues in clinical practice, which may lead nurses to make irrational clinical decisions thereby triggering nurse-patient conflict. Therefore, nursing educators can emphasise and develop the importance of ethical sensitivity in nursing students before they enter the clinical practice phase, and can include ethical sensitivity courses in pre-service training.

The present study also indicates that moral identity of intern nursing students is positively associated with moral resilience. The development of moral resilience involves not only establishing an environment for a culture of ethical practice, but also building and developing

the individual's ability to navigate moral dilemmas [8]. The findings of this study are further supported by research demonstrating that moral identity significantly predicts undergraduate nursing students' self-control [22]. These results suggest that nursing educators should prioritize and foster the development of moral identity in nursing students. For instance, learning activities such as workshops and ethics forums, combined with reflective practices, can help students explore moral character and strength within academic and clinical settings, thereby strengthening their moral resilience.

Several factors influence the moral resilience of trainee nursing students

Male nursing students have higher levels of moral resilience than female nursing students

This study found that male trainee nurse practitioners had relatively higher levels of moral resilience, meaning that gender was an influential factor in moral resilience ($P < 0.05$). This is more in line with previous findings on moral toughness in healthcare workers, with Spilg et al. suggesting that females are more likely to experience a decline in moral resilience, possibly because nursing is a predominantly female profession and females may incur additional risks when faced with morally troubling events [9]. In addition, males and females differ in their thinking styles and coping strategies. Males are more inclined to be rational and have relatively strong logical thinking skills when facing stressful and distressing events. In contrast, women's psychological characteristics are more delicate, cautious, and sensitive, which makes them more likely to perceive frustration and anxiety when encountering stressful events [33]. Therefore, when faced with moral dilemmas, women may be more susceptible, resulting in a relatively lower level of moral resilience. This finding suggests that nursing educators should pay more attention to the training outcomes of female nursing students when developing moral resilience training programs.

Higher level of moral resilience among nursing students who have received ethics courses and training

This study also found that nursing students who had previously received received ethics courses and training had higher levels of moral resilience. Ethics courses and training can help nursing students learn how to cope with moral dilemmas, thus increasing their level of moral resilience. The Johns Hopkins University School of Nursing and the hospital jointly developed the Mindful Ethical Practice and Resilience Academy(MEPRA), which includes knowledge, skills, and practical training in self-regulation, positive thinking, ethical sensitivity, and insight to enhance communication skills and ethical efficacy [34]. The training is applied to practical situations where ethical dilemmas may arise. In the final stage of the educational program, high simulation training and reflective debriefing are utilized to assess the training's effectiveness. By using experiential and simulation-based teaching methods, administrators can introduce the concept and development of moral resilience into their daily curriculum. This enhances the moral resilience of nursing students and prepares them for clinical situations.

Nursing students with very positive attitudes towards the nursing profession have higher levels of moral resilience

The study findings indicate that nursing students' level of moral resilience is impacted by their attitude towards the nursing profession. Students with a particularly positive attitude exhibit a relatively higher level of moral resilience. The rationale for this statement is that the professional attitude, which refers to an individual's cognitive and emotional perception of the profession, is a psychological state that determines the behavioural inclination of nursing students in the nursing occupation [35]. Students with positive attitudes tend to proactively perceive, analyse problems, and execute planned actions when confronted with studying or difficulty. In clinical practice, students exhibiting positive professional attitudes may exhibit greater composure when dealing with moral dilemmas, resulting in heightened levels of moral resilience.

Nursing students with high levels of moral identity have higher levels of moral resilience

The study indicates a positive correlation between moral identity and moral resilience among nursing students ($P < 0.05$), revealing that moral identity plays a pivotal role in shaping an individual's sense of self. Previous research has suggested a self-model of moral identity which proposes that moral identity acts as a vital motivator in determining one's ethical behavior [36]. Related research highlights that enhancing nurses' self-awareness can boost their moral resilience [37]. Moreover, empirical evidence suggests that moral identity significantly relates to self-control among undergraduate students [22]. In addition, moral identity is a crucial ingredient in the exercise of moral agency and the advancement of ethical practice [22]. This literature confirms the outcomes of the current research. The outcome implies that educators ought to acknowledge and cultivate the standard of ethical identity amongst nursing students. This can be executed by implementing educational interventions such as ethical seminars, forums, and reflective practices.

Limitation of this study

Participants may have experienced confusion with scale entries during questionnaire completion. Since this study utilized a web-based questionnaire, it is possible that the

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researcher was not able to promptly address such issues. Additionally, this study was conducted in a single province using a convenience sampling method, which may limit the generalizability of the findings to other regions. Finally, the study employed a cross-sectional survey, allowing us to comprehend the moral resilience levels of nursing students at a given time. However, causality could not be inferred.

Conclusion

This study investigated the present condition and factors that impact the degree of moral resilience among active nursing students. Our study's results indicate that the moral resilience of nursing students during their internship is deficient. Additionally, moral sensitivity, moral identity, and moral resilience have a positive correlation. The primary factors contributing to the moral resilience of nursing students are whether or not they have attended ethics and morality courses, gender, attitudes towards the nursing profession, and moral identity. The findings indicate that nursing educators and administrators could create curricula for nursing students based on the aforementioned factors. They could provide targeted interventions and training to enhance the moral resilience of nursing students, which could facilitate their clinical interships and employment prospects after graduation.

Author contributions
Shuo Zheng: Conceptualization, Methodology, Software, Investigation, Formal Analysis, Writing-Original Draft; Weiqing Zhang: Conceptualization, Methodology, Software, Investigation, Formal Analysis, Resources; Junmei Kong: Visualization, Conceptualization; Yan Wang: Resources, Supervision; Yaxuan Wu: Software, Validation; Xiaoli Guo: conceptualization, Funding Acquisition, Resources, Supervision, Writing-Reveiw & Editing.

Data availability
Data generated and/or analysed in this study are not publicly available but can be obtained from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
The study was approved by the Ethics Committee of the Second Affiliated Hospital of Zhengzhou University (Project No.2022376). All methods were performed in accordance with relevant guidelines and regulations (Declaration of Helsinki) and informed consent was obtained from all participants.

Patient or public contribution
None.

Competing interests
The authors declare no competing interests.

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