Review Article

From theory to practice: a systematic review and meta-analysis of ethical sensitivity in Iranian nursing students

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Abstract

Ethical sensitivity is vital for nursing students as it affects decision-making and care quality. This systematic review and meta-analysis assessed ethical sensitivity among Iranian nursing students. For this purpose, databases (MagIran, SID, PubMed, Scopus, EMBASE, and Web of Science) were searched up to December 30, 2024. Observational studies reporting ethical sensitivity scores were selected, and scores were standardized to a 0–100 scale. Heterogeneity was assessed using I^2, and analyses were performed with STATA. Sixteen studies yielded a pooled ethical sensitivity score of 67% (95% CI: 62–72), with substantial heterogeneity (I^2 = 87.2%). Subgroup analyses (by publication year and language) and meta-regression (age, sample size) identified no significant moderators, and sensitivity analysis and trim-and-fill confirmed the stability of the estimate. Based on the findings, ethical sensitivity among Iranian nursing students is moderate, which highlights the need for targeted educational interventions and enhanced clinical experiences.

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Introduction

Nurses represent the largest group of healthcare providers and clearly play a pivotal role in delivering patient care (1). However, they face daily challenges in providing optimal care, especially for vulnerable patients (2). These challenges are exacerbated in developing countries by factors such as job dissatisfaction, limited social support, workforce shortages, and the gap between theory and practice (3). Furthermore, rapid advances in medicine have expanded nursing responsibilities, making exposure to ethical dilemmas inevitable (4). Ethical commitments create complex situations for nurses, as their decisions must not only ensure high-quality care but also uphold patient dignity, privacy, trust, and comfort. Effective management and appropriate decision-making in such scenarios require a certain degree of ethical sensitivity among nurses (5).

Historically, the focus of nursing ethics education has evolved from a strict adherence to deontological codes to the cultivation of moral perception, a shift that gained momentum following James Rest's seminal conceptualization of "ethical sensitivity" in the 1980s (6). Ethical sensitivity is a fundamental aspect of nursing care that enables individuals to make appropriate decisions in ethically challenging situations (7). Defined as the capacity to identify ethical dimensions and address conflicts within nurse-patient relationships (8,9), it enhances the quality of care and serves as the foundation for ethical decision-making, encompassing actions, intentions, and emotions (10,11). Conversely, a decline in this sensitivity may jeopardize patient trust and public health (12). Given the profession's practical nature, this competency is significantly shaped and developed through hands-on clinical experience (13). To translate this theoretical concept into empirical data, researchers typically rely on standardized self-report measures. A prominent example is the Moral Sensitivity Questionnaire (MSQ), which is widely used to assess the multifaceted nature of moral sensitivity (14).

Nursing students encounter ethical challenges as soon as they enter hospital settings. Despite having limited experience, they confront complex clinical situations that demand ethical decision-making (15). As a result of their learning interactions and work with patients and staff, nursing students often face unexpected ethical dilemmas (16). Research highlights that nursing students frequently encounter ethical challenges, ranging from privacy breaches to discrimination (17,18). Such issues can compromise patient safety and diminish the

quality of care (19). Consequently, ethical sensitivity is prioritized alongside professional competence (20), making ethics education an integral part of the curriculum (15). These educational efforts aim to cultivate morally responsible students who can effectively navigate ethical dilemmas in their future careers (21).

Some studies have reported that the level of ethical sensitivity required for nursing students to identify and address the challenges they face is low to moderate (3,22,23). As future members of the nursing workforce, these students will inevitably encounter ethical challenges in their workplaces. Therefore, they must develop ethical awareness and sensitivity to provide holistic care, grounded in sound ethical decision-making (24). Nursing students are among the most critical groups requiring ethical education, practice, and training because the decisions they will make in their future workplaces are closely linked to ethical dimensions. These decisions not only influence patients' lives and deaths but also affect all aspects of nursing practice (25). Academic settings are pivotal for cultivating ethical sensitivity, which enhances professional commitment and patient advocacy (5,26,27). While essential for responsible decision-making, research indicates that students' ethical sensitivity levels vary significantly, influenced by individual characteristics, academic training, and clinical environments (2,5). Various studies conducted in Iran to assess ethical sensitivity among nursing students have reported differing results. To gain a clearer understanding of ethical sensitivity in this population, it is essential to comprehensively analyze and report the findings of these studies. Accordingly, the present systematic review and meta-analysis were conducted to estimate the overall ethical sensitivity score among nursing students in Iran.

Method

This systematic review and meta-analysis were conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Table 1). The protocol for this study has not been recorded anywhere.

Search Strategy

To access relevant articles, international databases such as PubMed, Web of Science, EMBASE, and Scopus, as well as national databases such as the Scientific Information Database (SID) and MagIran, were searched using keywords including "ethical sensitivity," "nurse," and "nursing student." The search strategy in PubMed was as follows: ("Moral Sensitivit*"[tiab] OR "Ethical Sensitivit*"[tiab]) AND ("Nurses"[Mesh] OR "Nurse*"[tiab] OR "Students, Nursing"[Mesh] OR "Nursing Staff"[Mesh] OR "Nursing Student*"[tiab] OR "Pupil Nurse*"[tiab] OR "Nursing

Personnel*"[tiab] OR "Registered Nurse*"[tiab]) AND ("Iran"[Mesh] OR "Iran*"[all] OR "Islamic Republic of Iran"[all]). To ensure comprehensive coverage, reference lists from eligible articles were also reviewed.

Inclusion and Exclusion Criteria

In this systematic review and meta-analysis, studies meeting the following inclusion criteria were analyzed: studies conducted on Iranian nursing students, observational studies (including cross-sectional, case-control, and cohort studies), articles published in either Persian or English, studies reporting raw ethical sensitivity scores (mean and standard deviation), and those providing access to full-text articles. Exclusion criteria included intervention studies, qualitative studies, review articles, letters to the editor, and studies involving other healthcare providers. Additionally, studies that reported the raw ethical sensitivity scores of nursing students combined with those of other healthcare students were excluded.

Study Selection and Data Extraction

All retrieved articles were imported into EndNote software (version 20), and duplicate records were removed. Subsequently, titles and abstracts were screened, and irrelevant articles were excluded. The full texts of the remaining articles were reviewed, and essential information—including the first author's name, year of publication, sample size, mean age of participants, language of publication, study location, questionnaire type used, and ethical sensitivity scores—was extracted using a predesigned data extraction form. All stages of study selection and data extraction were performed independently by two reviewers, and any disagreements were resolved through discussion and consensus. In two studies, ethical sensitivity scores were reported separately for two non-overlapping participant subgroups. Because each subgroup comprised different participants and provided an independent estimate of ethical sensitivity, the subgroups were treated as separate datasets in the meta-analysis. The sample size for each subgroup was entered separately, ensuring that no participant was included more than once in the analysis.

Methodological Quality

To evaluate the methodological quality of the articles, the Joanna Briggs Institute (JBI) tool was used. This tool was selected because it is specifically designed to evaluate the methodological rigor of observational research, offering a standardized approach to detect potential biases in sampling, measurement, and analysis. The quality assessment process was conducted independently by two authors, and any disagreements were resolved through consultation with a third author. This tool consists of eight items that focus on aspects such as the clarity of the inclusion criteria, a detailed

description of the sample and study setting, the validity and reliability of the measurement tools used, management of confounding factors, and assessment of outcomes. All items were weighted equally, without specific weighting for study characteristics. Each item was rated with one of the following responses: "Yes" (score of 1), "No" (score of 0), or "Not applicable" (score of 0). A higher score indicates better methodological quality of the selected studies. The final score ranged from 0 to 8, with 0-3 considered weak, 4-6 moderate, and 7 or higher strong (28).

Outcome

In this study, the outcome is the standardized score of ethical sensitivity. Although all included instruments are valid and reliable, they may emphasize slightly different facets of the construct. To minimize potential noise associated with these variations and to account for the fact that different studies have used various tools (with different scoring systems and numbers of questions), scores in their raw form should not be directly compared or aggregated. Therefore, all raw scores (reported mean ethical sensitivity scores) were converted to standardized scores on a 100-point scale. The transformation was performed using the following formula:

$$Standardized\ Score = \left(\frac{\text{Raw Score} - \text{Minimum Score}}{\text{Maximum Score} - \text{Minimum Score}}\right) \times 100$$

Raw Score: The observed mean score reported in the study

Minimum Score: The lowest possible score on the respective scale

Maximum Score: The highest possible score on the respective scale (29–31)

For example, if the mean ethical sensitivity score in a questionnaire with 25 items and a 5-point Likert scale (ranging from 1 to 5) is 65, and the possible score range is 25 to 125, the standardized score is calculated as follows:

$$\left(\frac{65-25}{125-25}\right) \times 100 = \left(\frac{40}{100}\right) \times 100 = 40$$

Statistical Analysis

All analyses were conducted using STATA software, version 17. Heterogeneity among studies was assessed using the I^2 index and Cochran's Q statistic. Accordingly, values of 25%, 50%, and 75% were interpreted as low, moderate, and high heterogeneity, respectively. If high heterogeneity was found, a random-effects model was used; otherwise, a fixed-effects model was applied. The cumulative results of the standardized ethical sensitivity score, along with a 95% confidence interval, were presented in a forest plot. Publication bias and the potential effects of small studies on the final outcome were evaluated using a funnel plot and Egger's test. Subgroup analyses were performed based on publication language (Persian and English), region (Region 5 and other regions of the country), and year of publication

(before and after 2020). To examine the influence of variables such as mean age, sample size, and year of publication on the standardized ethical sensitivity score, meta-regression was employed.

Results

A total of 563 articles were retrieved from both international and domestic databases. After removing duplicates, 279 articles remained. Initially, the titles and abstracts of these articles were reviewed by two independent authors. During this stage, 207 articles were excluded, and the full texts of the remaining 72 articles were assessed. Fifty-two articles had been conducted on other groups, so they could not be included, and another four articles were excluded due to insufficient reporting of questionnaire scoring details necessary for calculating the standardized score. Ultimately, the analysis was conducted on the 16 remaining articles. The article screening process is depicted in Figure 1.

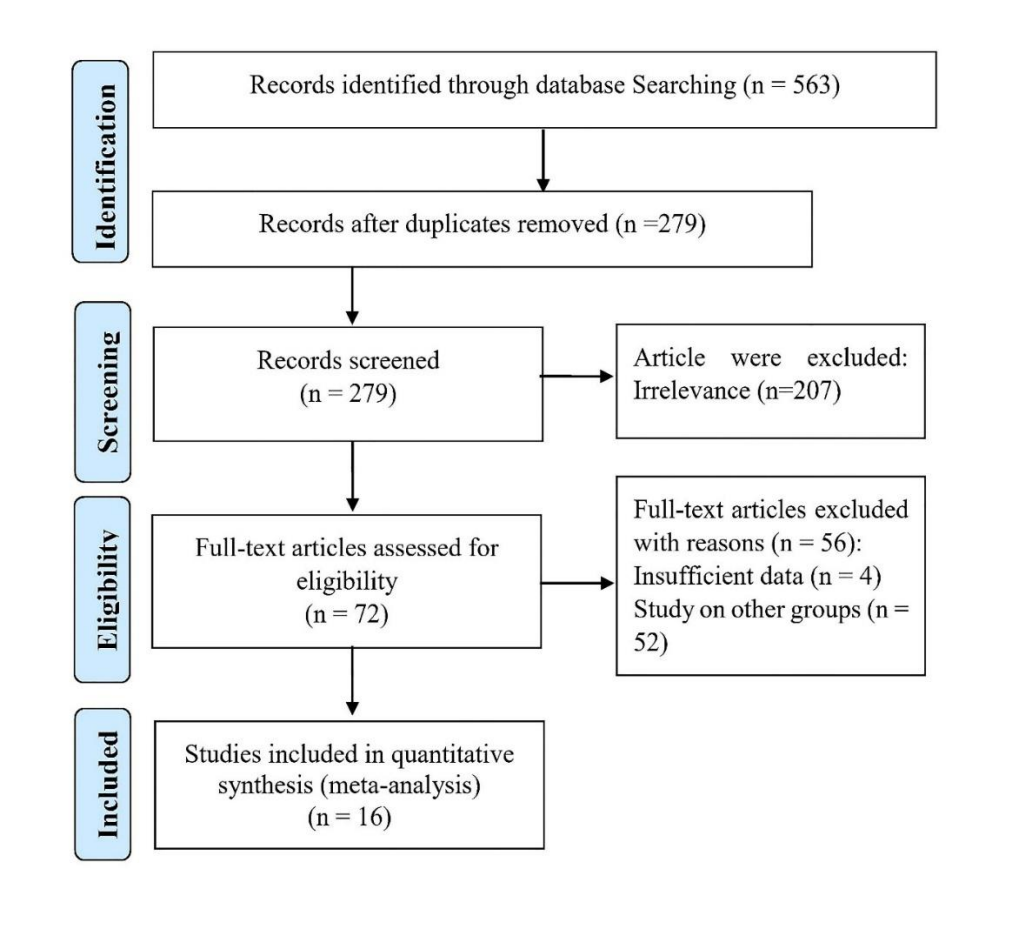

Figure 1. *PRISMA flow diagram detailing the literature search, screening process, eligibility criteria, and final inclusion of studies regarding ethical sensitivity among Iranian nursing students.*

The selected studies were conducted among 2,464 individuals in Tabriz, Yazd, Isfahan, Birjand, Tehran, Hamadan, Sabzevar, Mashhad, Bushehr, Zahedan, and Qazvin. The articles were published between 2015 and 2023. The largest and smallest sample sizes in the studies were 336 and 60 participants, respectively. Regarding publication language, 9 studies were published in Persian and 7 in English. A total of 16 studies were included in the review; however, in two studies, ethical sensitivity scores were reported separately for two distinct subgroups. Therefore, each subgroup was treated as an independent study in the meta-analysis, and the total sample size was calculated by summing the sample sizes of each subgroup. Ethical sensitivity was assessed using various versions of the Moral Sensitivity Questionnaire. Most studies (n = 14) used the 25-item Lützén Moral Sensitivity Questionnaire (L-MSQ-25), while one study used the 28-item Moral Sensitivity Questionnaire (MSQ-28), and another used Han's 25-item Moral Sensitivity Questionnaire (H-MSQ-25). The average age of the nursing students participating in these studies was 22.72 ± 2.82 years. The complete characteristics of the articles analyzed are presented in Table 1 (Table 1).

Table 1. *Characteristics of the Analyzed Articles*

First Author (Reference)	Year	Sample Size	Mean Age	Location	Language	Scale	Standard Score (%)	Quality
Rahmani et al. (32)	2023	140	20.32	Tabriz	English	MSQ-28	63.7	8
Nasiriani et al. (33)	2023	130	22.37	Yazd	Persian	L-MSQ-25	60.4	7
Bagheri et al. (34)	2023	158 80	20.34 23.31	Isfahan	English	L-MSQ-25	59.9 68.2	8
Yazdanparast et al. (35)	2022	144	21.81	Birjand	English	L-MSQ-25	59.6	7
Ghasemipour Hombari et al. (36)	2022	336	21.58	Tehran	English	L-MSQ-25	81.0	8
Mohammadi et al. (37)	2022	134	23.91	Hamadan	Persian	L-MSQ-25	62.6	8
Barkhordari-Sharifabad et al. (38)	2022	153	21.54	Yazd	Persian	L-MSQ-25	64.2	8
Shamsizadeh et al. (39)	2020	123	23.69	Hamadan	Persian	L-MSQ-25	65.0	8
Hoseini et al. (40)	2020	60	21.60	Sabzevar	English	H-MSQ-25	93.1	8
Mostafavian et al. (41)	2019	82	20.88	Mashhad	Persian	L-MSQ-25	61.3	7
Kohansal et al. (22)	2018	73	21.74	Bushehr	Persian	L-MSQ-25	68.2	8
Amiri et al. (42)	2018	198	31.19	Tabriz	Persian	L-MSQ-25	64.0	8
Salar et al. (43)	2016	140 93	28.56 21.37	Zahedan	English	L-MSQ-25	59.8 55.8	8
Karimi Noghondar et al. (44)	2016	110	22.17	Mashhad	Persian	L-MSQ-25	81.8	7
Borhani et al. (45)	2016	205	21.90	Qazvin	English	L-MSQ-25	66.1	8
Mousavi et al. (46)	2015	105	20.78	Tehran	Persian	L-MSQ-25	61.3	7

Note: *MSQ-28: Moral Sensitivity Questionnaire (MSQ)-28 item; L-MSQ-25: Lützén Moral Sensitivity Questionnaire (L-MSQ)-25-item; H-MSQ-25: Han's Moral Sensitivity Questionnaire-25 item*

The results of the subgroup analysis revealed that the standard score for ethical sensitivity in studies conducted in 2020 and thereafter was higher than in those conducted before 2020 (68% vs. 65.1%). Additionally, the standard score for ethical sensitivity was higher in English-language articles than in Persian-language articles (67.7% vs. 65.6%). The standard score in studies conducted in region 5 of the country (66.2%) was similar to the score reported in studies conducted in other regions (67.2%). However, no significant differences in ethical sensitivity scores were found across these factors. The pooled standardized score across the included studies is visually presented in the forest plot below (Figure 2).

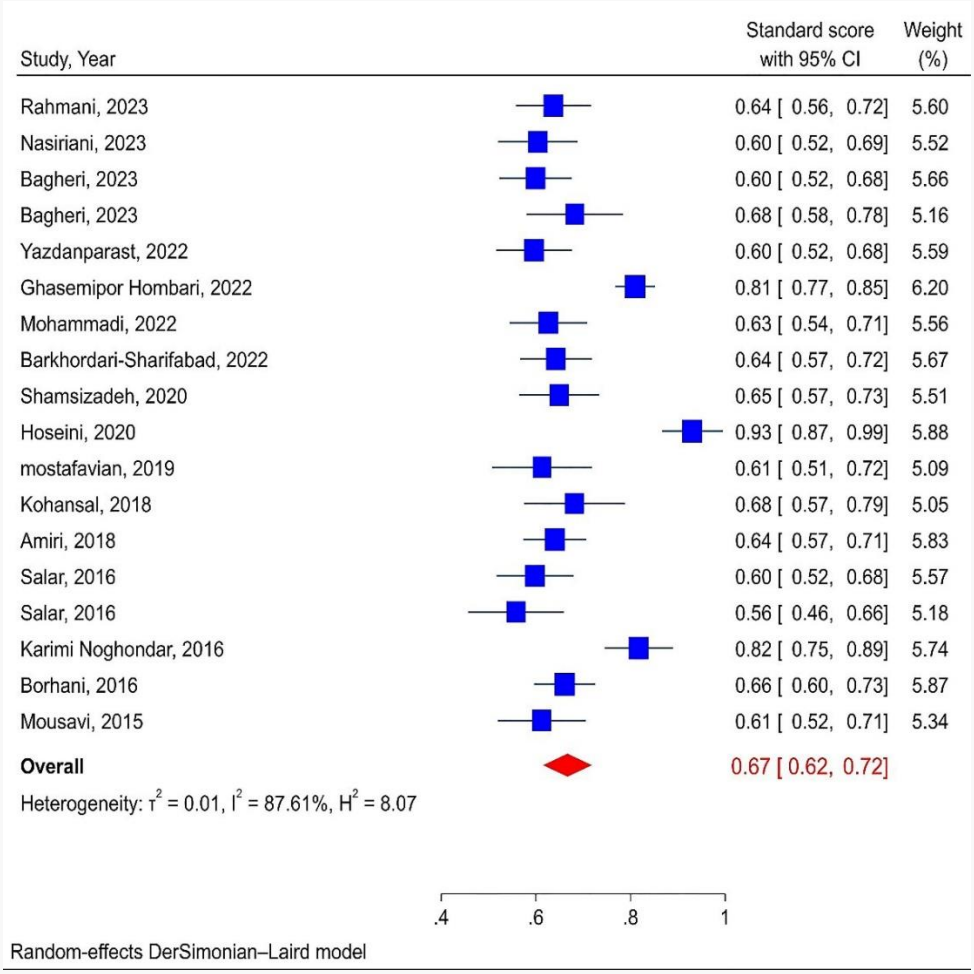

Figure 2. *Forest plot of the pooled standardized mean score of ethical sensitivity among Iranian nursing students. The plot displays the effect sizes (ES) and 95% confidence intervals (CI) for each study, along*

with the overall pooled estimate from the random-effects model. Squares indicate point estimates, and the size of each square indicates the study's weight.

Sensitivity analysis indicated that removing one study at a time did not result in significant changes to the overall standard score for ethical sensitivity. This demonstrates sufficient stability in the findings. Meta-regression results showed no significant associations between the standardized ethical sensitivity score and variables such as year of publication (P = 0.983), average participant age (P = 0.615), or sample size (P = 0.735). However, publication bias was statistically significant (P = 0.015). To evaluate and adjust for this bias, the trim-and-fill method was employed. This approach incorporated hypothetical studies (marked in orange in the visual representation) that might not have been published due to bias. The initial overall estimate before adjustment was 66.7% (95% CI: 61.6%–71.8%). After adjusting for publication bias, the estimate slightly increased to 68.9% (95% CI: 64.4%–73.4%). Additionally, publication bias is illustrated in the funnel plot shown in Figure 3.

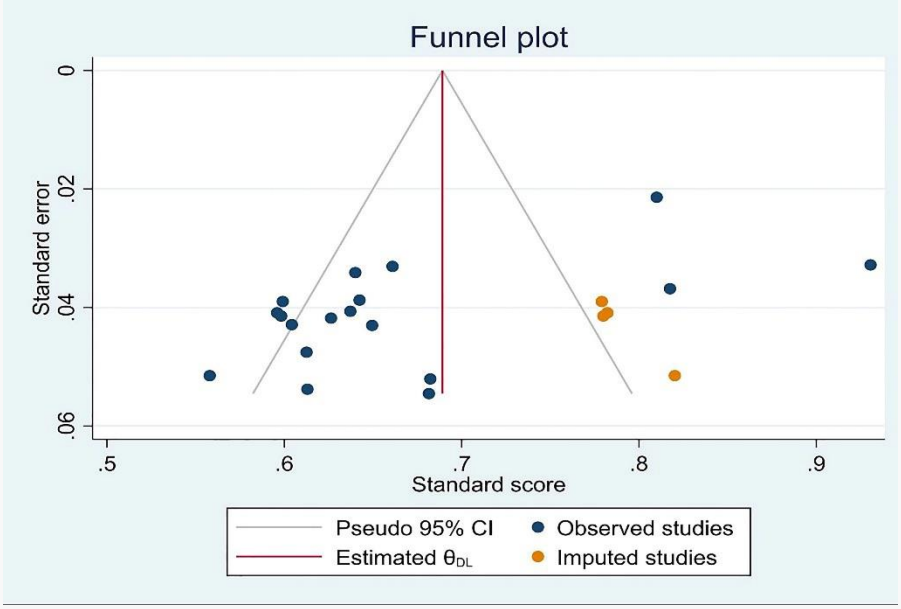

Figure 3. *Publication Bias Analysis: The funnel plot illustrates potential publication bias. Each circle represents a single study; blue circles indicate the actual studies included in the analysis, and orange circles represent hypothetical studies added through the trim-and-fill method to achieve funnel plot symmetry. These adjustments aim to provide a more accurate overall estimation by accounting for potential unpublished studies.*

Discussion

This systematic review and meta-analysis aimed to estimate the standardized score of ethical sensitivity among nursing students in Iran and revealed a cumulative standardized ethical sensitivity score of 66.7%. In other words, nursing students in Iran achieved 66.7% of the total possible score on ethical sensitivity, as measured by the available questionnaires, indicating a moderate level of ethical sensitivity. It is important to note that the high heterogeneity means the estimated pooled score of 67% should be viewed as a central tendency rather than a precise value applicable to all settings. The true score is likely to vary due to unmeasured factors, such as specific educational curricula, clinical environments, and cultural differences across universities.

This finding is consistent with the study by Sadrollahi and Khalili, which also reported a moderate mean standardized ethical sensitivity score (47). Additionally, the results align with some international studies. For instance, in a study conducted by Lee et al. in South Korea, ethical sensitivity among nursing students was also reported to be moderate. The authors emphasized the importance of revising educational curricula and increasing the focus on professional ethics training (48).

Similarly, in the study by Alnajjar et al., the mean ethical sensitivity score was reported as 14.15 ± 61.13, which, when standardized, equaled 60.31% of the total ethical sensitivity score (25). However, the study by Tuvesson and Lützén reported a significant discrepancy, with a standardized ethical sensitivity score of only 12% among nursing students (49). This notable difference may be attributed to variations in measurement instruments, scoring methods, or distinct cultural and educational contexts in the study setting. This variation across studies underscores the need for context-specific strategies to enhance ethical sensitivity among nursing students. Tailored educational interventions focusing on ethics could play a pivotal role in improving scores globally.

These results indicate that ethical sensitivity among nursing students is moderate, and sometimes even low, not only in Iran but also in other countries. This issue may stem from various factors, such as educational limitations, insufficient awareness of ethical issues, and practical challenges in clinical settings. Such

findings highlight the necessity of ethics education. Several studies support this outcome, demonstrating that ethics education and raising awareness have a positive impact on ethical sensitivity (50,51). Nursing educators should restructure ethics education to encourage all students to actively participate and recognize the importance of nursing ethics (52). Moreover, a 2018 study found that case-based professional ethics education significantly improves nursing students' ethical sensitivity (39). These findings emphasize the importance of innovative, interactive teaching methods to effectively address the ethical challenges future nurses will face.

Based on most studies, it can be concluded that ethical sensitivity scores among nursing students from 2015 to 2023 have not shown significant change, except when specific training methods, such as case-based approaches, have been implemented (3,16,23,39). The ethical sensitivity score in studies conducted after 2020 (68%) was slightly higher than in those conducted before 2020 (65.1%). However, as noted earlier, this difference was not statistically significant. Nevertheless, this descriptive finding may suggest a very small directional increase in recent years, which could be explored further in future studies with larger samples and more homogeneous methodologies. In Iran, changes in nursing students' curriculum have also been made, including the addition of more courses on professional ethics and the organization of practical workshops focused on ethics, law, and evidence-based care, which enhance ethical approaches (53).

On the other hand, the ethical sensitivity score reported in English-language articles (67.7%)—most of which were conducted in Iran and published in international journals—was slightly higher than in Persian-language articles (65.6%) published domestically. This difference might be attributed to greater access to international resources and higher educational standards reflected in English publications. Studies such as Jackson and Kuriyama have also indicated that articles published in English often demonstrate higher methodological quality (54). The ethical sensitivity scores did not differ significantly across various regions of the country. This finding suggests that geographic differences have little impact on nursing students' ethical sensitivity. In brief, ethical sensitivity seems to be more influenced by individual and educational factors than by geographical factors (55).

The heterogeneity rate, as measured by the I^2 index, was 87.61%. This index, which reflects

variability or differences in results across studies, indicates whether study outcomes are consistent or whether the differences are too substantial to allow aggregation. This heterogeneity may stem from differences in measurement methods, study samples, or cultural variations. To address this heterogeneity, a random-effects model was employed, and subgroup analysis and meta-regression were conducted to examine factors contributing to this variability (56). In the present study, there was no significant correlation between the cumulative standard score for moral sensitivity and either sample size or age among nursing students. Additionally, from 2015 to 2023, the moral sensitivity score among nursing students did not show a statistically significant change, as indicated by meta-regression analysis ($P > 0.05$).

The average age of the participants is also an important demographic variable in determining moral sensitivity. The results of this study indicated no correlation between the total moral sensitivity score and the students' age. However, various studies have shown that moral sensitivity can be associated with increased age, particularly with clinical experience. This difference suggests that the moral sensitivity score in students (typically aged 18 to 22 years) does not change with age, whereas in older nurses it increases with age (42,57). Park et al. found that younger nursing students, due to a lack of practical experience, may have lower moral sensitivity compared to older students or experienced nurses. On the other hand, increased age and clinical experience are generally associated with enhanced ability to understand complex ethical situations (51). Additionally, a study by Tuvesson and Lützén also found a significant relationship between age and moral sensitivity (49).

Studies by Borhani et al. (2016), Ersoy and Göz (2001), and Lee et al. (2021) have shown that sample size can affect the accuracy of moral sensitivity score estimates (3,9,48). Research suggests that in larger samples, due to greater diversity in demographic variables and professional experiences, the moral sensitivity score can be estimated more accurately. For instance, a study with a large sample might reflect greater diversity in how people deal with ethical issues, leading to a more realistic portrayal of moral sensitivity. On the other hand, studies with smaller sample sizes may yield different results due to limitations in generalizability and can be subject to bias (9,48). However, in the present study, there was no correlation between the cumulative standard score of moral sensitivity and the sample size. The sensitivity analysis results

showed that removing any individual study did not significantly affect the overall results, indicating the stability of the findings. Additionally, publication bias was significant in this study, but after applying the trim-and-fill method, only minimal changes were observed in the results. While publication bias can affect the results of meta-analyses (58), its impact was negligible in this study.

This study has several limitations that should be considered when interpreting the findings. First, the study protocol was not registered in PROSPERO, which may limit methodological transparency. Second, ethical sensitivity was assessed using self-report questionnaires, which may have been influenced by social desirability bias. This means that students might have provided responses that appeared more ethically acceptable than their actual perceptions. Third, the findings of this study are specific to nursing students in Iran and may not be generalizable to other healthcare student groups. Fourth, no meta-analysis examining the standardized cumulative score of ethical sensitivity in nursing students was found. As a result, direct comparisons with other meta-analyses were not possible, and the findings were interpreted based on individual studies. Finally, potential unmeasured moderators, such as specific ethics course hours, the type of clinical placement, and instructor qualifications, were inconsistently reported across the included studies, preventing a detailed analysis of their impact. This may affect the strength of the overall conclusions and highlights the need for further research that explicitly measures and reports these educational variables.

Conclusion

The results of this study indicate that ethical sensitivity among nursing students in Iran is moderate and aligns with findings from some international studies. The slight differences in ethical sensitivity scores based on publication year, language of publication (i.e., English vs. Persian), and geographic region may be attributed to factors such as improvements in ethics education, methodological quality of studies, and cultural differences. However, the high heterogeneity between studies suggests that further research is needed in this area. Furthermore, standardized, consistent measurement tools should be used in future studies to facilitate accurate comparisons and reduce heterogeneity.

Ethical Approval and Consent to Participate

Not applicable

Consent for Publication

Not applicable

Availability of Data and Materials

The datasets used in the present study are available from the corresponding author upon reasonable request.

Competing Interests

The authors declare that they have no competing interests.

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Authors' Contributions

RGG and SS were responsible for the study conception and design. Data collection was performed by RGG, FD, and KB. Data analysis, interpretation, and the drafting of the manuscript were carried out by RGG, KB, and FD. All authors (FD, SS, KB, and RGG) critically revised the manuscript for important intellectual content. All authors have read and approved the final version of the manuscript and confirm that they meet the ICMJE criteria for authorship.

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