

Impact of Lecture Versus Group Discussion-Based Ethics Training on Nurses' Moral Reasoning, Distress, and Sensitivity: A Randomized Clinical Trial

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Abstract

Nurses' ethical choices and behavior strongly influence the quality of care they provide. Strengthening moral reasoning is therefore essential for improving ethical decision-making in clinical practice. This study aimed to evaluate and compare the effects of ethics training delivered through lectures versus group discussions on nurses' moral reasoning, moral distress, and moral sensitivity. In this randomized clinical trial with a pre- and post-test design, 66 nurses with below-average moral reasoning scores were randomly divided into three groups (n = 22 each): two intervention groups and one control group. The interventions included ethics training via lectures or group discussions, while the control group received no instruction. Participants completed a sociodemographic survey, the Nursing Dilemma Test (NDT), the Moral Distress Scale (MDS), and the Moral Sensitivity Questionnaire (MSQ). Data were analyzed using both unadjusted and adjusted binary logistic regression, with results expressed as odds ratios (OR) and 95% confidence intervals (CI). Adjusted analyses indicated that discussion-based training led to greater improvements in nursing principle thinking (NPT) scores compared to lecture-based training (OR: 13.078, 95% CI: 3.238–15.954, P = 0.008). Both lecture and discussion groups achieved significantly higher NPT scores than the control group (lecture: OR: 14.329, 95% CI: 2.005–16.171, P < 0.001; discussion: OR: 18.01, 95% CI: 5.834–22.15, P < 0.001). Moral sensitivity increased more after discussion sessions than lectures (OR: 10.874, 95% CI: 6.043–12.886, P = 0.005) and the control group (OR: 13.077, 95% CI: 8.454–16.774, P = 0.002). Both training methods reduced moral distress compared to control, with no significant difference between them (lecture: OR: 0.105, 95% CI: 0.015–0.717, P = 0.021; discussion: OR: 0.089, 95% CI: 0.015–0.547, P = 0.009). Ethics training enhances nurses' moral reasoning, and group discussions further improve moral sensitivity. These findings support incorporating ethics workshops into professional nursing education and student curricula to strengthen ethical practice.

Keywords: Moral reasoning, Ethics training, Moral distress, Moral sensitivity, Nursing

Background

Patient care is a central aspect of nursing and represents both the science and the art of the profession. Delivering high-quality and ethical care requires nurses to draw

upon their personal, social, moral, and spiritual capacities [1, 2]. In nursing practice, adherence to ethical principles is considered even more fundamental than the act of caring itself [3], making the ethical dimension of patient care an essential component of professional practice [4, 5]. With advances in science and technology, patient care has become increasingly complex, placing nurses in situations that demand sound ethical decision-making [6, 7].

Ethical decision-making in nursing is a challenging process influenced by factors such as sociodemographic characteristics, moral reasoning abilities, moral sensitivity, and experiences of moral distress [8–10]. It

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involves systematically evaluating a situation with conflicting choices to arrive at the most morally appropriate decision [11, 12]. A key element of this process is moral reasoning, which enables nurses to make rational and ethically sound judgments when confronting everyday dilemmas [13, 14]. Awareness of ethical challenges in clinical practice encourages nurses to consider the consequences of their decisions and act in accordance with professional principles such as honesty, confidentiality, and fairness [15, 16].

Moral sensitivity enhances nurses' ability to apply ethical principles effectively in patient care. It encompasses understanding ethical dimensions and includes aspects such as responsibility, prioritizing ethical issues, tolerance, and emotional stability [8, 17, 18]. Conversely, moral distress is a frequent challenge in nursing, often creating conflicts in patient care and potentially compromising the delivery of quality care. This distress can hinder nurses' ability to make correct moral decisions, ultimately affecting overall community health outcomes [19, 20]. Understanding how sociodemographic factors, moral reasoning, moral sensitivity, and moral distress influence ethical behavior provides valuable insights for policymakers to design programs that enhance nurses' ethical performance. Given the limited comprehensive data on these factors, this study investigates the relationships between nurses' moral reasoning, moral sensitivity, and moral distress, and their sociodemographic characteristics.

Moral development is critical for nurses to manage patient care efficiently and effectively [21]. However, making ethical decisions in daily practice can be difficult due to frequent moral dilemmas [15, 22], highlighting the need for strategies to strengthen ethical decision-making and reduce related challenges [23]. Training is considered one effective approach to improve nurses' moral reasoning and sensitivity while decreasing moral distress. Previous studies have shown that traditional lecture-based ethics programs may not sufficiently enhance ethical decision-making [4, 24]. Consequently, active learning strategies, such as case-based learning [15], simulation [25], exposure to challenging scenarios [26], and multimedia education [27], have been recommended to achieve better outcomes.

Group discussion (GD) is one such active learning technique, often used to explore complex issues in depth [28]. However, the effectiveness of GD in improving nurses' ethical reasoning, distress, and sensitivity compared to traditional lecture methods remains unclear.

This study, therefore, aimed to examine and compare the effects of ethics training delivered through lectures versus group discussions on nurses' moral reasoning, moral distress, and moral sensitivity.

Methods

Trial design

This randomized clinical trial with a pre- and post-test design aimed to evaluate and compare the effects of ethical decision-making training delivered through lectures versus group discussions on nurses' moral reasoning, moral distress, and moral sensitivity. The study protocol was approved by the Ethics Committee of Baqiyatallah University of Medical Sciences, Tehran, Iran (approval code IR.BMSU.REC.1394.145), in accordance with the Declaration of Helsinki [29]. The trial was registered in the Iranian Registry of Clinical Trials (IRCT2015122116163N5) on 02/07/2016. Written informed consent was obtained from all participants, and the study was conducted and reported following the CONSORT guidelines [30].

Setting and participants

All nurses at Baqiyatallah Hospital in Tehran, Iran, were eligible to participate if they held a bachelor's or higher degree in nursing and had at least one year of direct patient care experience. In 2015, a total of 270 nurses were selected by census method and invited to complete questionnaires assessing moral reasoning, moral distress, and moral sensitivity. After excluding 25 incomplete questionnaires, 245 nurses were included in the final sample (response rate: 90.7%). Among these, 86 nurses had moral reasoning scores below the community average. Of these 86 nurses, 66 who were willing to participate and had no prior attendance in nursing ethics workshops or courses were selected using simple random sampling and assigned to three groups (two experimental, one control) through block randomization.

Sample size

Based on Borhani *et al.* [31] and calculated using Altman's nomogram with a 95% confidence level, a 1.96 confidence interval, 10% type II error, and 90% power, the initial sample size was determined to be 17 participants per group. To account for potential attrition,

the sample size was increased to 22 participants per group.

Randomization

Participants were randomly assigned into three equal groups ($n = 22$ each): two experimental groups (receiving ethics training via lectures or group discussions) and one control group (no training). Block randomization was performed using computer-generated permuted blocks of six, implemented with sealed envelopes and Random Allocation Software (RAS; Informer Technologies, Madrid, Spain).

Intervention

Both experimental groups attended an 8-hour, one-day workshop designed to teach ethical decision-making principles and enhance moral reasoning skills. The lecture group received a structured symposium where the lecturer presented scenarios, offered solutions to ethical dilemmas, and addressed participant questions. The group discussion workshop involved interactive discussion of predetermined ethical scenarios, during which participants made and defended ethical decisions, critiqued one another's reasoning, and received feedback from the researcher on the correctness of their conclusions.

The educational content was identical for both experimental groups, minimizing the risk of information bias. Topics covered included basic ethics principles, the significance of ethical awareness for nurses, professional ethics, nursing practice principles (e.g., autonomy, confidentiality, accountability), ethical decision-making frameworks, Kohlberg's moral development levels, and practical scenario-based exercises. The program syllabus was validated through feedback from faculty members and the hospital ethics committee.

Data collection and study instruments

Data were gathered using four questionnaires: a sociodemographic form, the Nursing Dilemma Test (NDT), the Moral Distress Scale (MDS), and the Moral Sensitivity Questionnaire (MSQ). These tools were initially completed once by participants to assess baseline levels of moral reasoning, moral distress, and moral sensitivity. To evaluate the effects of ethical decision-making training, participants completed the same questionnaires both before and after the intervention.

Sociodemographic questionnaire

This questionnaire included twelve items covering participants' age, gender, marital status, work experience, ward type (general or intensive care), job position (head nurse, nurse, or in-charge nurse), employment type (full-time, part-time, contract), shift type (fixed or rotating), overtime hours, awareness of the nursing code of ethics, familiarity with patients' rights, and previous attendance in ethics courses.

Nursing Dilemma Test (NDT)

Developed by Patricia Crisham in 1981 at the University of Minnesota [32], the NDT presents six ethical dilemmas encountered in nursing practice: (a) newborn anomalies, (b) forced medication, (c) adult requests for euthanasia, (d) new nurse orientation, (e) medication errors, and (f) terminally ill adults. Each scenario has three sections:

1. Participants select the best course of action from three options, categorized as correct, incorrect, or unanswered.
2. Based on Kohlberg's Moral Development Theory, participants rank six statements according to personal importance. This generates the Nursing Principled Thinking (NPT) score, ranging from 18 to 66 across all scenarios, with higher scores reflecting stronger moral reasoning.
3. Participants indicate prior experience with similar dilemmas; familiarity scores range from 6–17 (familiar) or 18–30 (unfamiliar).

The Persian version of the NDT demonstrated high reliability, with Cronbach's alpha values of 0.82 and 0.95 reported by Borhani *et al.* [33] and Zirak *et al.* [34], respectively.

Moral Distress Scale (MDS)

The MDS, validated in Iran by Atashzadeh *et al.* [35], assesses the intensity of moral distress in ICU nurses. It comprises 30 items across three dimensions: inappropriate competencies and responsibilities (10 items), errors (11 items), and violations of ethical principles (9 items). Responses are scored on a 4-point Likert scale (0 = none to 4 = very high), with total scores ranging from 0–120. Average item scores classify distress as low (0–1), moderate (1.01–2), high (2.01–3), or very high (3.01–4). Higher scores indicate greater moral distress. The Cronbach's alpha for the total scale and its subscales ranged from 0.89 to 0.96 [36].

Moral Sensitivity Questionnaire (MSQ)

The MSQ, developed by Lutzen *et al.* [37] and later adapted internationally, evaluates nurses' ethical sensitivity in clinical practice. Initially containing 30 items, it was refined to 25 items across six subscales: respect for patient autonomy, communication knowledge, professional knowledge, ethical problem experience, application of moral concepts, and integrity/benevolence. Items are scored on a 5-point Likert scale (0 = no comment to 4 = strongly agree), yielding a total score of 0–100, with 0–50 indicating low, 50–75 moderate, and 75–100 high moral sensitivity. The Persian version demonstrated good reliability, with Cronbach's alpha values ranging from 0.80 to 0.81 [38, 39].

Statistical analysis

Categorical variables were presented as frequencies and percentages, while continuous variables were expressed as means with standard deviations (SD). Associations between sociodemographic characteristics and mean scores of the Nursing Dilemma Test (NDT), Moral Distress (MD), and Moral Sensitivity (MS) were evaluated using independent t-tests, one-way ANOVA, and Bonferroni post hoc tests. Categorical comparisons across the three study groups were performed using Chi-square or Fisher's exact tests.

To examine changes in questionnaire scores over time and differences between groups, repeated measures ANOVA (RMANOVA) and one-way ANCOVA were conducted, both with unadjusted and adjusted models controlling for age, gender, marital status, work experience, ward type, shift work, and overtime hours. Pairwise comparisons were performed using Bonferroni post hoc tests.

Univariate and multivariate binary logistic regression analyses were used to explore associations between sociodemographic variables and scores of moral reasoning, moral distress, and moral sensitivity among 245 nurses. Additionally, the relationship between study group assignment and post-intervention scores was analyzed in the 66 nurses who received the training using unadjusted and adjusted logistic regression. Associations were reported as odds ratios (OR) with 95% confidence intervals (CI). Forest plots were generated using GraphPad Prism 9©, and all statistical analyses were

performed in SPSS version 21, with significance set at $P < 0.05$.

Results

All 245 nurses completed the questionnaires. The mean total scores for Nursing Principled Thinking (NPT) and familiarity with ethical dilemmas in the Nursing Dilemma Test were 40.80 ± 6.71 and 13.55 ± 4.09 , respectively. Based on moral reasoning levels, 15.9% of nurses were classified as pre-conventional, 76.3% as conventional, and 7.8% as post-conventional. Single nurses had significantly higher NPT scores than married nurses (43.13 ± 7.60 versus 40.45 ± 6.52 , $P = 0.035$). Most participants (78.4%) reported familiarity with similar ethical dilemmas, and no significant associations were found between familiarity scores and sociodemographic factors.

The mean total moral distress score was 60.66 ± 26.23 , slightly above the average range. Dimension-specific scores were 18.29 ± 9.44 for inappropriate competencies and responsibilities, 23.12 ± 10.35 for errors, and 19.25 ± 9.05 for not respecting ethical principles, with no significant differences across sociodemographic variables.

The average total moral sensitivity score was 63.78 ± 10.47 , indicating a moderate level among the nurses. No significant differences were observed between total moral sensitivity and sociodemographic characteristics. However, several sub-dimensions of moral sensitivity showed significant variations. Female nurses scored higher than male nurses in respect for patient autonomy and communication knowledge, while contract employees and those with fewer overtime hours also had higher scores in these dimensions. Married nurses and those working in ICU had higher scores in professional knowledge. Females demonstrated higher scores in experiencing ethical problems and conflicts, and nurses with fixed shifts scored higher in applying moral concepts in decision-making than those on rotation shifts.

Findings from section a of the NDT

Responses to the Section A scenarios of the Nursing Dilemma Test are summarized in Additional File 2 Table S4. When presented with the scenario of a newborn with abnormalities, 65.3% of nurses chose resuscitation, 24.9% favored administering medication against the patient's wishes, and 4.1% were undecided. In the case

of a competent adult requesting aid to die, 93.5% of participants indicated they would provide respiratory support. For new nurse orientation, 33.9% suggested allocating specific time for guidance, while 8.6% were uncertain. Regarding medication errors, 90.6% agreed these should be reported. Finally, for the scenario involving terminally ill adults, less than half of the nurses (44.45%) supported answering patients' questions, and 15.5% remained undecided.

Binary logistic regression analysis

The relationship between sociodemographic variables and Nursing Principled Thinking (NPT) scores from Section B of the NDT was assessed using univariate and

multivariate logistic regression, presented in **Figure 1A and B**. Multivariate results revealed that higher NPT scores were significantly associated with being single (OR: 1.66, 95% CI: 1.289–3.506, $P = 0.023$), having work experience of 15 years or less (OR: 2.297, 95% CI: 1.993–5.314, $P = 0.042$), working in general wards rather than intensive care (OR: 1.677, 95% CI: 1.023–3.858, $P = 0.045$), and having full awareness of the nursing code of ethics compared with partial (OR: 2.757, 95% CI: 1.43–5.316, $P = 0.002$) or no awareness (OR: 4.08, 95% CI: 1.68–9.909, $P = 0.001$). Additional analyses evaluating associations of sociodemographic factors with familiarity, moral distress, and moral sensitivity are shown in Additional File 2 Tables S5–S7, though no significant links were observed for these outcomes.

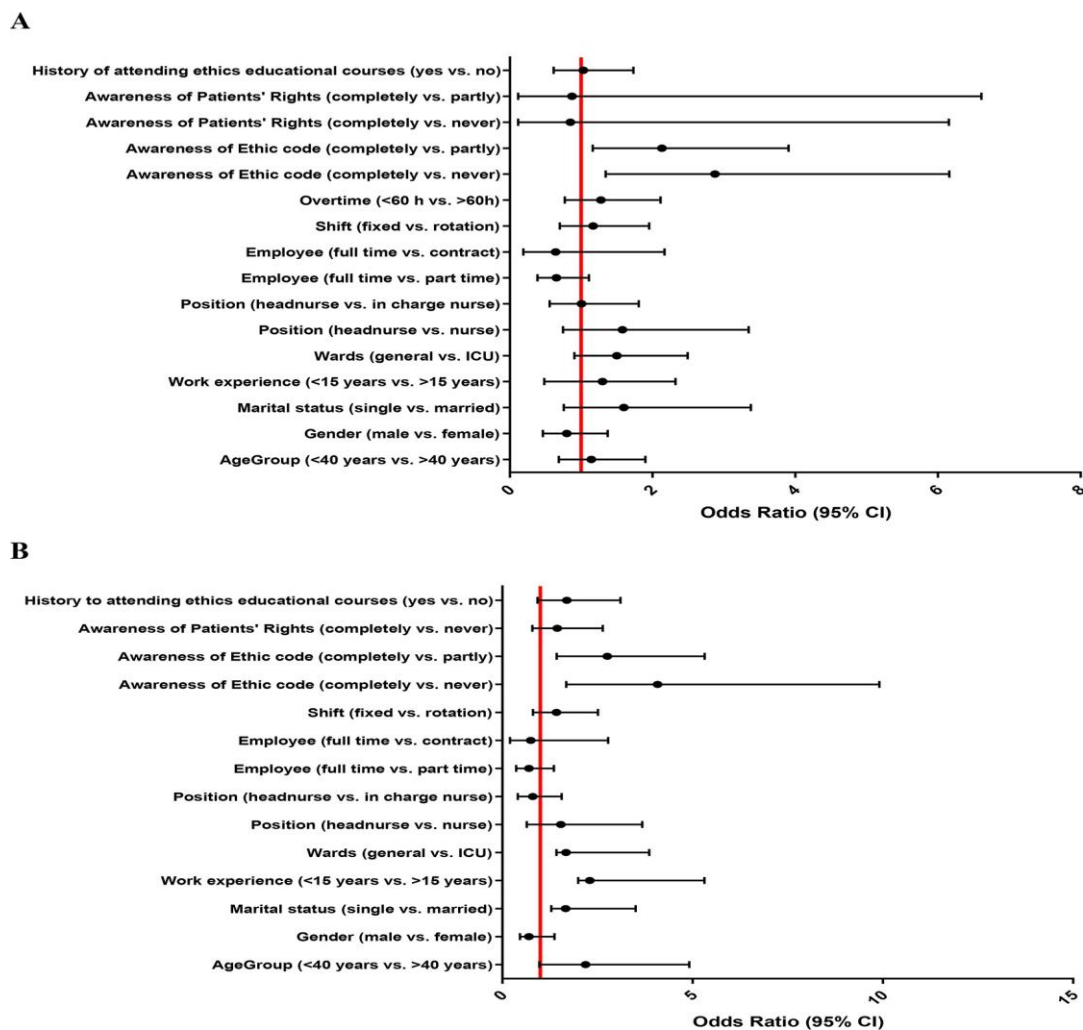


Figure 1. Forest plot of (A) univariate and (B) multivariate binary logistic regression analysis to show the association of sociodemographic characteristic with the section B (NP score ≤ 41 vs. >41) of the Nursing Dilemma Test

Participant characteristics in phase two (n = 66)

Figure 2 displays the CONSORT flow of participants in the study's second phase. From the initial pool of 245 nurses, 66 were selected for follow-up because their NPT scores were below the community average, they had not previously attended any nursing ethics courses, and they agreed to participate. These nurses were randomly divided into three groups of 22: a lecture-based training group, a group discussion-based training group, and a control group with no intervention.

The average ages for the lecture, discussion, and control groups were 37.3 ± 7.9 , 40.1 ± 5.6 , and 37.3 ± 6.4 years, respectively. Female nurses predominated in each group, representing 77.3%, 63.6%, and 68.2%. Post hoc Tukey testing revealed a significantly higher mean age in the

almond group compared to the lavender group (63.2 ± 9.1 vs. 56.9 ± 9.1 , $P = 0.016$). Marital status differed significantly between the groups ($P < 0.001$).

No statistically significant differences were found in gender distribution ($P = 0.729$) or educational level ($P = 0.078$). Overall, the three groups were comparable regarding other demographic variables, including age ($P = 0.555$), work experience ($P = 0.832$), ward type ($P = 0.650$), position ($P = 0.528$), employment type ($P = 0.136$), shift type ($P = 0.299$), overtime hours ($P = 0.785$), and knowledge of patients' rights ($P = 0.683$) (**Table 1**). However, nurses in the group discussion cohort demonstrated significantly higher awareness of the nursing ethical code compared to the other groups ($P = 0.002$).

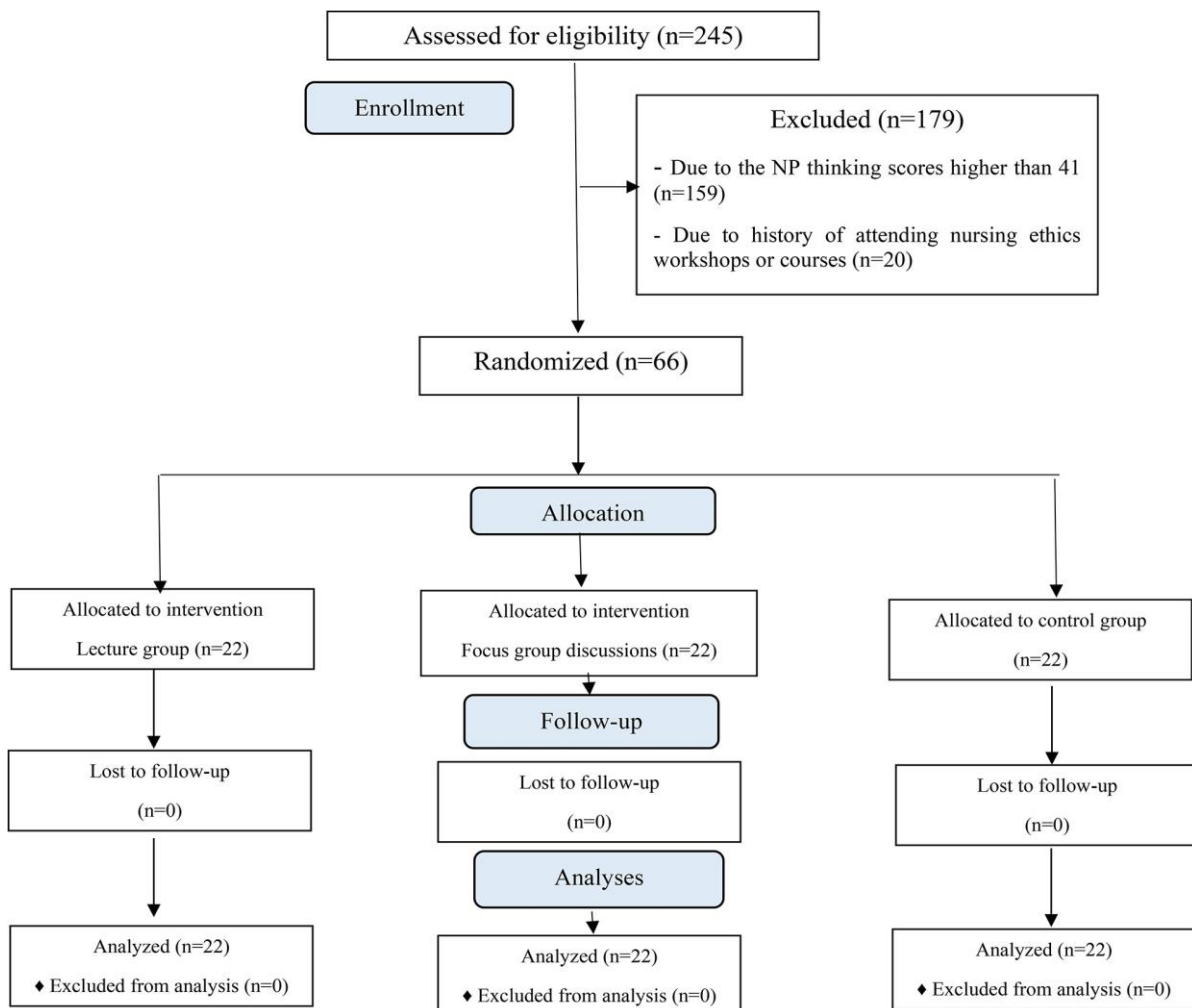


Figure 2. CONSORT flow diagram

Table 1. Sociodemographic characteristics of the participants in three groups of study (n = 66)

Sociodemographic characteristics		Total (n=66)	Lecture group (n = 22)	Discussion group (n = 22)	Control group (n = 22)	P-value
Gender	Male	20 (30.3)	5 (22.7)	8 (36.4)	7 (31.8)	0.605
	Female	46 (69.7)	17 (77.3)	14 (63.6)	15 (68.2)	
Age (year)	≤ 40	42 (63.6)	15 (68.2)	12 (54.5)	15 (68.2)	0.555
	> 40	24 (36.4)	7 (31.8)	10 (45.5)	7 (31.8)	
Marital status	Single	13 (19.7)	6 (27.3)	5 (22.7)	2 (9.1)	0.288
	Married	53 (80.3)	16 (72.2)	17 (77.3)	20 (90.9)	
Work experience (year)	≤ 15	36 (54.5)	11 (50)	12 (54.5)	13 (59.1)	0.832
	> 15	30 (45.5)	11 (50)	10 (45.5)	9 (40.9)	
Ward of working	General	29 (43.9)	11 (50)	10 (45.5)	8 (36.4)	0.650
	ICU	37 (56.1)	11 (50)	12 (54.5)	14 (63.6)	
Position	Head nurse	10 (15.2)	4 (18.2)	4 (18.2)	2 (9.1)	0.528
	In charge nurse	19 (28.8)	6 (27.3)	4 (18.2)	9 (40.9)	
	Nurse	37 (56.1)	12 (54.5)	14 (63.6)	11 (50)	
Employment types	Full time	39 (59.1)	11 (50)	11 (50)	17 (77.3)	0.136
	Part time	4 (6.1)	3 (13.6)	1 (4.5)	0	
	Contract employees	23 (34.8)	8 (36.4)	10 (45.5)	5 (22.7)	
Shift working	Fixed shift	40 (60.6)	16 (72.7)	13 (59.1)	11 (50)	0.299
	Rotation shift	26 (39.4)	6 (27.3)	9 (40.9)	11 (50)	
Overtime work (hours)	≤ 60	34 (51.5)	10 (45.5)	12 (54.5)	12 (54.5)	0.785
	> 60	32 (48.5)	12 (54.5)	10 (45.5)	10 (45.5)	
Awareness of	Completely	12 (18.2)	4 (18.2)	8 (36.4)	0	0.002 *
Ethical code	Partly	41 (62.1)	14 (63.6)	14 (63.6)	13 (59.1)	
	Never	13 (19.7)	4 (18.2)	0	9 (40.9)	
Awareness of	Completely	49 (74.2)	15 (68.2)	17 (77.3)	17 (77.3)	0.683
Patients' Rights	Partly	16 (24.2)	6 (27.3)	5 (22.7)	5 (22.7)	
	Never	1 (1.5)	1 (4.5)	0	0	

*P < 0.05 considered as significant

Changes in scores before and after the intervention

The study examined how nursing dilemma handling, moral sensitivity, and moral distress scores changed across the three groups before and after the training, as shown in **Table 2**. Initially, the groups were comparable, with no statistically significant differences in nursing principled thinking (NPT) ($P = 0.838$), familiarity with

dilemmas ($P = 0.640$), moral distress ($P = 0.931$), or moral sensitivity ($P = 0.159$).

After the intervention, both the lecture and discussion groups showed marked improvements in NPT scores compared to the control group ($P < 0.001$). Notably, nurses participating in group discussions achieved higher NPT scores than those in the lecture group (52.50 ± 2.44 versus 44.64 ± 4.70 , $P < 0.001$), indicating a stronger

enhancement in moral reasoning. Scores reflecting familiarity with similar dilemmas did not show significant changes among the groups after the intervention ($P = 0.997$).

Moral sensitivity improved most in the discussion group, with scores significantly exceeding those in the lecture group (76.50 ± 11.52 vs. 61.55 ± 11.57 , $P < 0.001$) and the control group (76.50 ± 11.52 vs. 64.27 ± 9.45 , $P < 0.001$). Although overall moral distress scores did not

differ significantly across groups post-intervention, there was a clear reduction in the “disregard for ethical principles” subscale for both intervention groups. In the lecture group, scores dropped from 21.91 ± 9.59 to 17.36 ± 7.75 ($P = 0.020$), while in the discussion group, scores decreased from 17.27 ± 8.54 to 12.59 ± 4.82 ($P = 0.017$). Additionally, the discussion group showed significantly lower scores than the control group in this subscale after training (12.59 ± 4.82 vs. 20.09 ± 10.07 , $P = 0.007$).

Table 2. Comparison of pre- and post-intervention scores of nursing dilemma, moral distress and moral sensitivity between three groups

Parameters	Times	Lecture group (n = 22)	Discussion group (n = 22)	Control group (n = 22)	P-value ***	P-value ****
Nursing dilemma test (NDT)						
NP score	Pre-intervention	36.09 ± 5.28	36.18 ± 3.72	35.45 ± 4.09	0.838	< 0.001*
	Post-intervention	44.64 ± 4.70	52.50 ± 2.44	35.36 ± 4.03	< 0.001*	
	P-value**	< 0.001*	< 0.001*	0.936		
Familiarity score	Pre-intervention	14.91 ± 3.41	14.50 ± 3.76	13.82 ± 4.33	0.640	0.811
	Post-intervention	13.68 ± 3.63	13.46 ± 3.67	13.73 ± 4.39	0.997	
	P-value*	0.203	0.445	0.943		
Moral Sensitivity Questionnaire (MSQ)						
Total moral sensitivity score	Pre-intervention	60.36 ± 11.68	59.23 ± 11.43	65.55 ± 11.34	0.159	0.010*
	Post-intervention	61.55 ± 11.57	76.50 ± 11.52	64.27 ± 9.45	< 0.001*	
	P-value*	0.742	< 0.001*	0.689		
Moral Distress Scale (MDS)						
Total Moral distress score	Pre-intervention	60.23 ± 21.34	57.32 ± 26.93	58.09 ± 30.32	0.931	0.337
	Post-intervention	53.41 ± 21.34	44.73 ± 17.24	61.32 ± 31.93	0.085	
	P-value*	0.176	0.104	0.754		
Moral distress's dimensions						
Inappropriate competencies and responsibilities	Pre-intervention	17.32 ± 7.18	17.27 ± 7.85	15.82 ± 10.90	0.814	0.651
	Post-intervention	16.77 ± 7.86	14.68 ± 8.84	16.86 ± 11.11	0.684	
	P-value*	0.806	0.381	0.785		

Errors	Pre-intervention	23.05 ± 9.79	22.77 ± 12.30	23.09 ± 12.11	0.995	0.316
	Post-intervention	18.82 ± 9.11	17.45 ± 6.78	24.36 ± 12.78	0.056	
	P-value*	0.059	0.117	0.739		
Not respecting the ethics principles	Pre-intervention	21.91 ± 9.59	17.27 ± 8.54	19.18 ± 9.45	0.252	0.175
	Post-intervention	17.36 ± 7.75	12.59 ± 4.82	20.09 ± 10.07	0.009*	
	P-value*	0.020*	0.017*	0.771		

Data are presented as mean ± SD; * P < 0.05 considered as significant, ** Obtained from paired t-test (within-group differences); *** Obtained from unadjusted one-way ANCOVA (analysis of covariance) with repeated measures (RMANOVA) (between-group differences); **** Obtained from adjusted (based on age group, gender, marital status, work experience, wards, shift work and overtime) one-way ANCOVA (analysis of covariance) with repeated measures (between-group differences)

Regression analysis across study groups

Binary logistic regression, both unadjusted and adjusted for confounding factors, was performed to explore the relationship between study group assignment and outcomes including NPT scores, familiarity, moral distress, and moral sensitivity (**Figures 3 and 4**). The adjusted analysis indicated that nurses in the discussion group were significantly more likely to achieve higher NPT scores compared to those in the lecture group (OR: 13.078, 95% CI: 3.238–15.954, P = 0.008). Similarly, both lecture (OR: 14.329, 95% CI: 2.005–16.171, P < 0.001) and discussion groups (OR: 18.01, 95% CI: 5.834–22.15, P < 0.001) showed a greater likelihood of improved NPT scores relative to the control group.

Regarding moral sensitivity, participation in the discussion group was associated with a higher probability of score improvement compared to the lecture group (OR: 10.874, 95% CI: 6.043–12.886, P = 0.005) and the control group (OR: 13.077, 95% CI: 8.454–16.774, P = 0.002). In terms of moral distress, only the trained groups experienced a significant reduction compared with controls. No statistically meaningful difference was observed between the lecture and discussion groups themselves. Specifically, the odds of reduced moral distress were lower in the lecture group compared to control (OR: 0.105, 95% CI: 0.015–0.717, P = 0.021) and in the discussion group versus control (OR: 0.089, 95% CI: 0.015–0.547, P = 0.009). Complete details of these regression analyses are provided in Additional File 2 (Tables S8–S11).

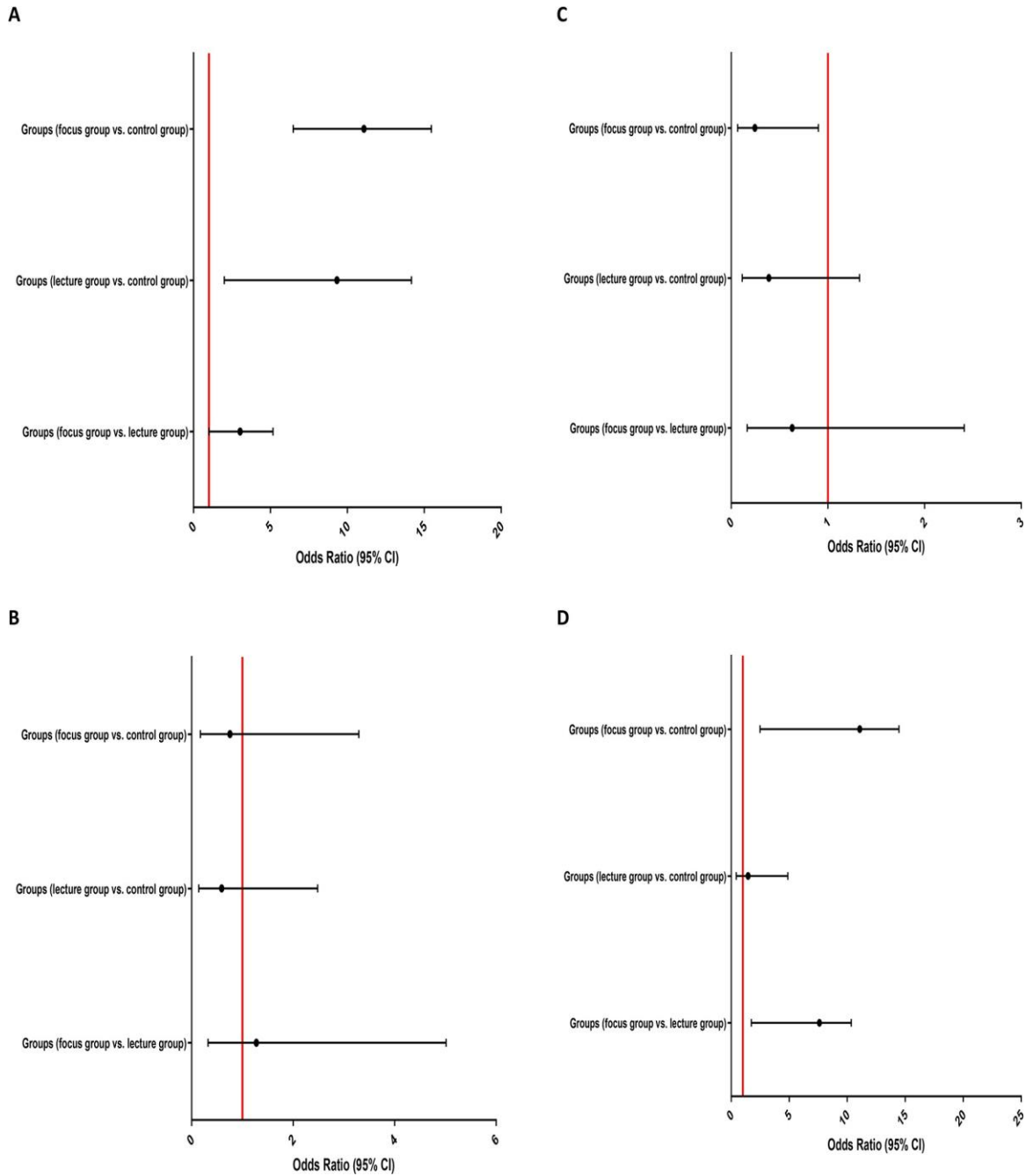


Figure 3. Forest plot of unadjusted binary logistic regression analysis to evaluate the association between three groups of study with the (A) NPT score (≤ 50 vs. >50), (B) familiarity score (≤ 18 vs. >18), (C) moral distress score (≤ 58 vs. >58) and (D) moral sensitivity score (≤ 75 vs. >75)

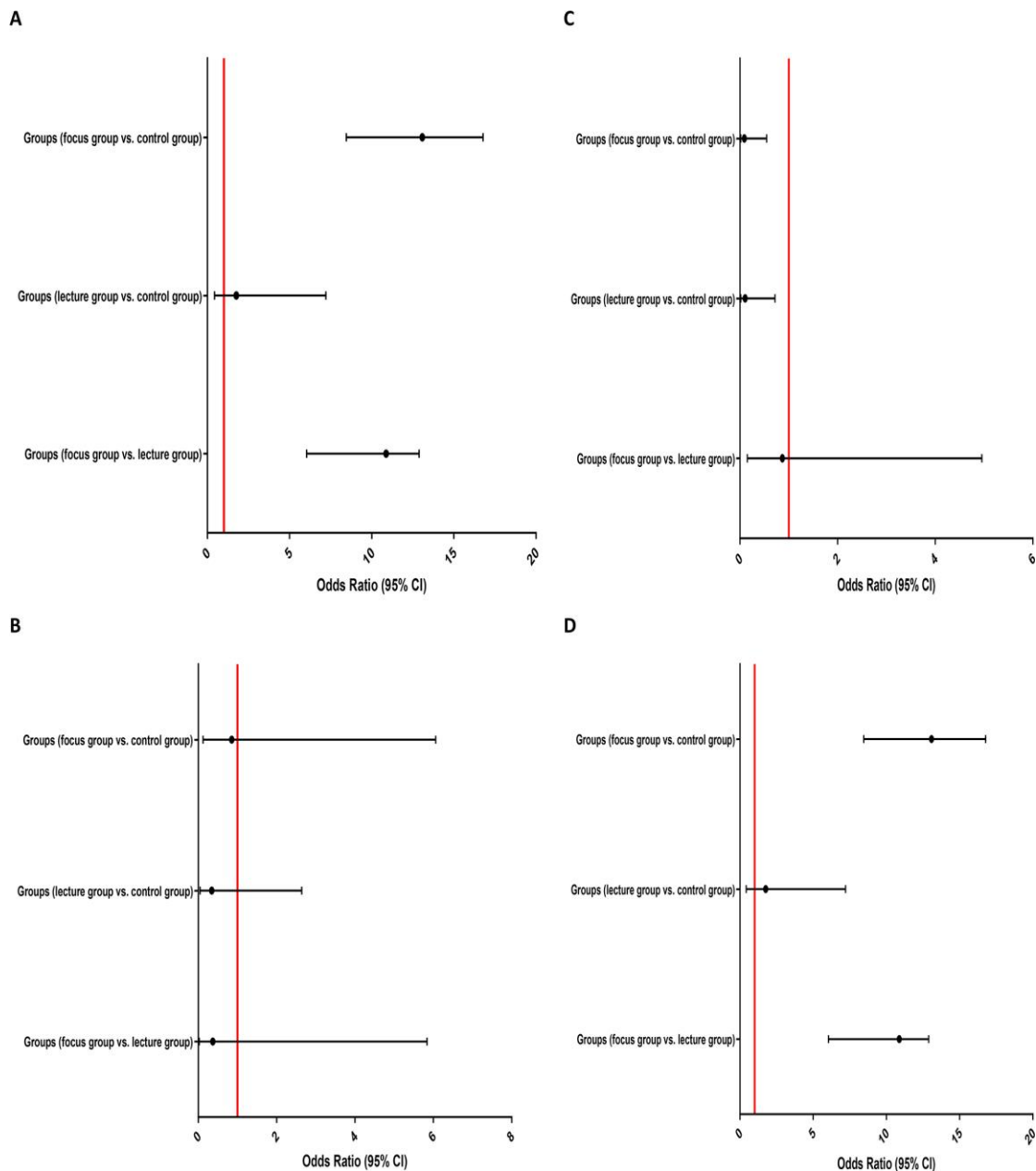


Figure 4. Forest plot of adjusted binary logistic regression analysis to evaluate the association between three groups of study with the (A) NPT score (≤ 50 vs. >50), (B) familiarity score (≤ 18 vs. >18), (C) moral distress score (≤ 58 vs. >58) and (D) moral sensitivity score (≤ 75 vs. >75)

Discussion

The findings of this study indicated that nurses' levels of moral reasoning were low, moral sensitivity was moderate, and moral distress was high compared to prior studies and average community levels. Analysis of section A of the NDT revealed that most nurses were familiar with common ethical dilemmas, which aligns with the results from section C of the NDT. This

familiarity can positively influence nurses' ethical decision-making [34, 40]. Nevertheless, decision-making in clinical settings is shaped by multiple factors such as institutional policies, professional confidence, high-pressure work environments, complex patient conditions, and interactions with patients, which sometimes lead nurses to rely on their personal judgment rather than strictly following regulations [41, 42].

In this study, the average NPT score among nurses (40.80 ± 6.71) was slightly below the community mean. Previous research reported higher scores: Zirak *et al.* [34] found 46.67 ± 6.7 , Borhani *et al.* [43] reported 42.16 ± 5.8 , and Ham *et al.* [44] recorded 51.5 ± 7.9 . Such differences may be influenced by factors including workplace rules, education level, cultural and social norms, clinical experience, and personal beliefs [45]. Multivariate regression revealed that being single, having less than 15 years of experience, working in general wards, and being fully aware of the code of ethics were associated with higher NPT scores.

The second phase of the study demonstrated that ethical training significantly increased NPT scores in both experimental groups compared to controls. Most participants (76.3%) were at the conventional level of moral reasoning, indicating reliance on organizational rules, social harmony, and maintaining appearances in the eyes of others, according to Kohlberg's theory. Only a small proportion (7.8%) reached the post-conventional level, likely due to organizational pressures to conform and the inherent complexity of clinical ethical decisions. Training that focused on professional ethics, nursing principles, and strategies for navigating ethical dilemmas effectively improved nurses' ethical reasoning skills, as reflected in the increased NPT scores.

Regarding moral distress, the overall mean scores were high in the dimensions of "inappropriate competencies and responsibilities" and "errors," while the "not respecting ethical principles" dimension was moderate. The highest distress occurred in the "errors" domain, consistent with prior findings by Atashzadeh-Shoorideh *et al.* [36]. No significant correlation was observed between moral distress and sociodemographic factors, suggesting that moral distress affects nurses across all ages, genders, experience levels, and work settings. Previous evidence indicates that over half of nurses experience moral distress at work [46, 47].

Although ethical training in the study had limited impact on reducing total moral distress, it significantly decreased distress in the "not respecting ethical principles" dimension. Moral distress can disrupt ethical decision-making, compromise care objectives, and negatively affect societal health outcomes. Additionally, it may contribute to mental and physical strain, reduce job satisfaction, and decrease nurses' commitment to the profession, ultimately affecting quality of care [35, 48]. These results suggest that training alone is insufficient to address distress related to "inappropriate competencies

and responsibilities" and "errors." Effective mitigation requires supportive work environments where nurses can express concerns without fear of repercussion, foster open communication and collaboration within healthcare teams, provide recognition and resources for ethical decision-making, and address systemic issues contributing to moral distress. Creating such structures may help reduce distress and enhance both nurse well-being and care quality.

The present study revealed that most nurses exhibit a moderate level of moral sensitivity, aligning with findings from previous research [17, 49]. Since nurses frequently encounter critical situations requiring ethically sound decisions, it is essential for them to be aware of and responsive to ethical issues in their practice. No significant correlation was found between sociodemographic variables and moral sensitivity, which is consistent with the study by Hassanpoor *et al.* [39]. This suggests that nurses, regardless of individual or professional characteristics, generally maintain a moderate level of moral sensitivity. Factors limiting moral sensitivity may include patient-related issues, environmental conditions, and managerial challenges. Among patient-related obstacles, a common issue is the lack of understanding about nurses' roles, while environmental barriers often include crowded wards [50]. Notably, the study showed that participation in an ethical decision-making training program improved nurses' moral sensitivity.

Consistent with prior studies [51–53], this research found that moral reasoning tends to decline as nurses' work experience increases. Possible reasons include heavy workloads, burnout, job dissatisfaction, and the stress of diverse clinical environments, which can reduce motivation to address ethical challenges. Additionally, more experienced nurses may prioritize organizational interests over patients' rights due to increased institutional commitment [54]. The findings emphasize that ethical behavior is more strongly influenced by targeted ethics education than by sociodemographic factors. Moreover, group discussion-based ethics training proved more effective than lectures in enhancing moral reasoning and moral sensitivity. In lecture-based training, information is delivered rapidly, and participants often remain passive, limiting opportunities to practice problem-solving, decision-making, and critical analysis. Although lecture participants did show improvement compared to the control group, their gains were notably smaller than those observed in the discussion group,

indicating persistent challenges in applying ethical knowledge and decision-making confidently.

In contrast, ethics education through group discussions significantly enhanced both moral reasoning and moral sensitivity. The benefits of this method likely stem from active engagement, collaborative discussion, and exposure to realistic or simulated clinical scenarios [55].

Limitations

This study has several limitations. The first phase was descriptive and conducted at a single-center hospital, relying on self-reported questionnaires, which may introduce response bias or overestimation. The short interval between intervention and post-test limited the ability to assess long-term effects on moral reasoning, sensitivity, and distress. Additionally, the strong impact observed from a single discussion session (high Hedge's *g* effect size) may reflect the focus on nurses with lower baseline performance; results may be smaller among more experienced or higher-performing nurses. These factors limit the generalizability of the findings, and results should be interpreted cautiously. Nonetheless, the study provides useful insights for nurse educators and policy makers aiming to implement continuous ethical decision-making training to enhance nurses' awareness and understanding of ethical care.

Conclusion

The study found that, compared with previous research and average community levels, nurses' moral reasoning was low, moral sensitivity moderate, and moral distress high. Higher moral reasoning was associated with being single, having less work experience, working in general wards, and having full awareness of the code of ethics, whereas moral sensitivity and moral distress showed no significant relationship with demographic variables. The randomized clinical trial component demonstrated that group discussion-based ethical decision-making training effectively enhances nurses' moral reasoning and sensitivity but does not reduce moral distress. This suggests that nurses, regardless of their demographic characteristics or levels of ethical reasoning and sensitivity, experience moral distress, highlighting the need for policies and strategies aimed at alleviating its causes in the workplace.

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