

Moral Sensitivity and Caring Behaviors Among Nurses: A Cross- Sectional Study of Total and Subscale-Level Associations Research Note

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Abstract

Objective

Caring behaviors are central to nursing care, but their association with moral sensitivity may differ across dimensions and be obscured by total scores. This study examined total- and subscale-level associations between these constructs among nurses.

Results

This cross-sectional correlational study included 220 nurses randomly sampled from teaching hospitals affiliated with Isfahan University of Medical Sciences. Caring behaviors and moral sensitivity were measured using the Caring Behaviors Inventory-16 and Moral Sensitivity Questionnaire. Mean total scores were 83.53 ± 9.97 and 60.17 ± 13.04 , respectively. In the primary analysis of 185 nurses with valid paired scores, total moral sensitivity was not associated with total caring behaviors (Spearman's $\rho = -0.063$, 95% CI -0.205 to 0.082 ; $p = 0.396$); Pearson correlation and robust regression analyses yielded consistent null results. In secondary analyses with false-discovery-rate correction, relational knowledge was positively associated with all four caring-behavior domains ($\rho = 0.195$ – 0.333 ; $q \leq 0.011$), whereas professional knowledge and use of moral concepts showed inverse associations with several caring-behavior domains ($\rho = -0.176$ to -0.250 ; $q \leq 0.023$). The association between moral sensitivity and caring behaviors may therefore be dimension-specific and not captured by total scores.

Introduction

Caring behaviors are central to professional nursing and encompass ethical, interpersonal, and clinical actions through which nurses respond to patients' needs. They are widely regarded as indicators of patient-centered care and care quality, although their expression may vary across individual, professional, and organizational contexts [1–9].

Moral sensitivity is the capacity to recognize ethical issues, anticipate the moral consequences of clinical decisions, and respond appropriately to patients' needs and vulnerabilities. This capacity is particularly relevant in nursing, where clinicians routinely encounter challenges involving autonomy, confidentiality, justice, care prioritization, and tensions between institutional demands and patient-centered values [10–14].

Previous studies have reported associations between moral sensitivity and caring behavior or related outcomes, but findings have varied across populations, settings, instruments, and analytic approaches [12–26]. Moreover, most studies have relied primarily on total scores, despite the multidimensional nature of both constructs. Such analyses may mask relationships between specific dimensions, and few studies have combined subscale-level assessment with appropriate control for multiple comparisons [1, 4, 12, 15].

This study therefore examined total- and subscale-level associations between moral sensitivity and caring behaviors among nurses in selected teaching hospitals affiliated with Isfahan University of Medical Sciences and explored demographic and occupational factors associated with moral sensitivity.

Main Text

Materials and Methods

Study Design and Participants

This cross-sectional correlational study included clinical nurses working in four teaching hospitals affiliated with Isfahan University of Medical Sciences, Isfahan, Iran (Alzahra, Feyz, Noor, and Chamran hospitals). Nurses from different wards and shifts were selected randomly from hospital staff lists, and data were collected during morning, evening, and night shifts. The sampling process was conducted from September to November 2024. Eligibility required employment as a clinical nurse, at least one year of clinical experience, willingness to participate, and written informed consent. Nurses were excluded if they reported a major stressful life event during the previous six months, a diagnosed psychological disorder, or use of psychotropic or narcotic medications. Overall, 220 nurses were recruited.

Sample Size

Sample size was calculated for the primary correlation between total moral sensitivity and total caring behaviors. Fisher's z transformation, with a two-sided α of 0.05, 80% power, and a minimum detectable correlation of approximately 0.21, yielded 178 participants. The target was increased to 220 to account for incomplete data. Ultimately, 185 participants had valid paired total scores, providing approximately 80% power to detect an absolute correlation of about 0.20.

Data Collection and Measures

Following institutional and ethical approval, eligible nurses completed anonymous self-administered questionnaires after providing written informed consent. Data were collected using a study-specific demographic and occupational form and two previously published instruments. The form captured the demographic and occupational variables reported in Table 1; an English-language version is provided in Additional file 2.

Table 1
Participant characteristics and descriptive statistics of study variables

Panel A. Demographic and occupational characteristics (N = 220)				
Characteristic	Category / statistic	Valid n	Missing n	n (%) or value
Age, years	Mean $\pm$ SD	215	5	32.43 $\pm$ 6.84
	Median (min–max)	215	5	31 (22–52)
Sex	Male	220	0	61 (27.7)
	Female	220	0	159 (72.3)
Marital status	Married	220	0	137 (62.3)
	Single	220	0	83 (37.7)
Education level	Bachelor's degree	220	0	194 (88.2)
	Master's degree	220	0	26 (11.8)
Employment status	Project-based	218	2	29 (13.3)
	Contractual/temporary/company-employed	218	2	121 (55.5)
	Permanent/official	218	2	68 (31.2)
Work experience, months	< 60	220	0	85 (38.6)
	60–119	220	0	68 (30.9)
	120–179	220	0	37 (16.8)
	180–239	220	0	15 (6.8)
	240–312	220	0	9 (4.1)
	> 312	220	0	6 (2.7)
Hospital	Alzahra	220	0	26 (11.8)
	Feyz	220	0	10 (4.5)
	Noor	220	0	31 (14.1)
	Chamran	220	0	153 (69.5)
Monthly income category	< 10	220	0	18 (8.2)
	10–15	220	0	187 (85.0)
	15–20	220	0	6 (2.7)

Panel A. Demographic and occupational characteristics (N = 220)				
Characteristic	Category / statistic	Valid n	Missing n	n (%) or value
	> 20	220	0	9 (4.1)
Clinical ward	Internal medicine	220	0	74 (33.6)
	Surgery	220	0	50 (22.7)
	Critical care units	220	0	96 (43.6)
Housing status	Rental	217	3	86 (39.6)
	Owned	217	3	131 (60.4)
Additional employment	Study-site workplace only	214	6	153 (71.5)
	Additional workplace	214	6	61 (28.5)
Physical activity	Yes	220	0	81 (36.8)
	No	220	0	139 (63.2)
Recreation time per week	< 1 hour	218	2	70 (32.1)
	2–4 hours	218	2	106 (48.6)
	> 4 hours	218	2	42 (19.3)
Night shifts per month	0–4	218	2	62 (28.4)
	4–8	218	2	75 (34.4)
	> 8	218	2	81 (37.2)
Self-rated health status	Excellent	217	3	72 (33.2)
	Moderate	217	3	130 (59.9)
	Poor	217	3	15 (6.9)
Liking the nursing job	High	218	2	34 (15.6)
	Moderate	218	2	128 (58.7)
	Low	218	2	56 (25.7)
Liking the work environment	High	220	0	25 (11.4)
	Moderate	220	0	128 (58.2)
	Low	220	0	67 (30.5)
Conflict with others	High	217	3	18 (8.3)

Panel A. Demographic and occupational characteristics (N = 220)				
Characteristic	Category / statistic	Valid n	Missing n	n (%) or value
	Moderate	217	3	72 (33.2)
	Low	217	3	127 (58.5)
Moral sensitivity category	Low, ≤ 50	195	25	31 (15.9)
	Moderate, > 50 to 75	195	25	144 (73.8)
	High, > 75	195	25	20 (10.3)

Table 1
(continued)

Panel B. Descriptive statistics and internal consistency of study variables						
Scale/subscale	Valid n	Theoretical range	Observed range	Mean $\pm$ SD	Median (IQR)	Cronbach's alpha
Caring behaviors, total (CBI-16)	210	16–96	56–96	83.53 $\pm$ 9.97	84 (75–92)	0.948
Respecting others (CBI)	212	7–42	28–42	36.65 $\pm$ 4.06	37 (34–40)	0.859
Assurance of human presence (CBI)	220	1–6	3–6	5.25 $\pm$ 0.83	5 (5–6)	—
Positive connectedness (CBI)	216	5–30	14–30	26.00 $\pm$ 3.59	27 (23–29)	0.871
Professional knowledge and skills (CBI)	220	3–18	8–18	15.40 $\pm$ 2.28	16 (14–17)	0.821
Moral sensitivity, total	195	0–100	13–100	60.17 $\pm$ 13.04	58 (53–67)	0.858
Respect for patient autonomy (MS)	218	0–12	3–12	7.44 $\pm$ 2.13	7 (6–9)	0.228
Relational knowledge (MS)	207	0–20	0–20	14.86 $\pm$ 3.48	15 (13–17)	0.707
Professional knowledge (MS)	216	0–8	0–8	3.25 $\pm$ 1.89	3 (2–4)	0.434
Experience of moral conflicts (MS)	220	0–12	3–12	7.75 $\pm$ 2.03	8 (6–9)	0.182
Use of moral concepts (MS)	210	0–20	3–20	11.96 $\pm$ 3.35	12 (10–15)	0.531
Honesty and benevolence (MS)	216	0–28	3–28	15.30 $\pm$ 4.49	15 (13–17)	0.691
Notes: Values are n (%) unless otherwise indicated. CBI, Caring Behaviors Inventory; MS, moral sensitivity; IQR, interquartile range; em dash, not applicable.						

Caring behaviors were assessed using the Caring Behaviors Inventory-16 (CBI-16) developed by Wolf et al. [27], using the validated Persian version reported by Ghafouri et al. [1]. Its 16 items are scored from 1 (never) to 6 (always), yielding a total score of 16–96; higher scores indicate more frequent caring behaviors. For secondary domain-level analyses, items were grouped into four conceptual domains used in the published CBI literature: respecting others (items 1, 2, 3, 4, 7, 8, and 10), assurance of human presence (item 11), positive connectedness (items 5, 6, 9, 12, and 15), and professional knowledge and skills (items 13, 14, and 16). These conceptual domain scores were distinguished from the factor

structure identified in the Persian psychometric evaluation [1]. Exact item allocation is provided in Additional file 1.

Moral sensitivity was assessed using the previously published 25-item Persian form of the Moral Sensitivity Questionnaire (MSQ), derived from the MSQ developed by Lützén and colleagues [28] and previously described in Iranian nursing research [12]. Items are scored on a five-point scale from 0 to 4, yielding a total score of 0–100, with higher scores indicating greater moral sensitivity. Scores were classified as low (≤ 50), moderate (> 50 –75), or high (> 75). The six domains are respect for patient autonomy, relational knowledge, professional knowledge, experience of moral conflicts, use of moral concepts, and honesty and benevolence. Exact item allocation is provided in Additional file 1.

Data Management and Statistical Analysis

Data were checked for coding errors, out-of-range values, missingness, and agreement between item-level and recorded total scores. Total and domain-level scores were recalculated. Descriptive analyses used available observations, correlations used pairwise-valid data, and regression analyses used complete cases. Internal consistency was evaluated with Cronbach's alpha for total scales and multi-item subscales; alpha was not calculated for the one-item assurance subscale, and the two-item professional-knowledge subscale was interpreted cautiously.

Analyses were conducted using IBM SPSS Statistics version 26, with additional reproducible calculations for confidence intervals, false-discovery-rate correction, effect sizes, and robust regression. Categorical variables were summarized as frequencies and percentages and continuous variables as means with standard deviations and medians with interquartile ranges or ranges. Distributions were assessed using descriptive indices, graphical inspection, and the Shapiro–Wilk test.

Spearman correlation was the primary analysis of associations between moral sensitivity and caring behaviors; Pearson correlation was a sensitivity analysis for the total-score association. Associations between six moral-sensitivity and four caring-behavior domains were secondary analyses and were adjusted using the Benjamini–Hochberg procedure. Demographic and occupational associations with total moral sensitivity were examined using Spearman correlation, Mann–Whitney U, or Kruskal–Wallis tests. Significant Kruskal–Wallis results were followed by Holm-adjusted comparisons; epsilon-squared and Cliff's delta quantified effect sizes.

Robust linear regression with HC3 standard errors assessed the total-score association before and after adjustment for covariates identified through univariable screening. Regression coefficients, 95% confidence intervals, p values, and R^2 were reported. Tests were two-sided; $p < 0.05$ indicated significance for primary analyses and $q < 0.05$ for multiple domain-level comparisons.

Ethical Considerations

The Ethics Committee of Isfahan University of Medical Sciences approved the study (IR.MUI.NUREMA.REC.1403.074). Participation was voluntary, written informed consent was obtained, and data were analyzed anonymously.

Results

Participant Characteristics and Study Variables

A total of 220 nurses participated, with a mean age of 32.43 ± 6.84 years. Most participants were female, married, held a bachelor's degree, and worked at Chamran Hospital, while critical care units represented the largest clinical group. Among 195 nurses with valid moral-sensitivity scores, 144 (73.8%) had moderate moral sensitivity (Table 1, Panel A).

The mean total Caring Behaviors Inventory-16 score was 83.53 ± 9.97 ($n = 210$; Cronbach's $\alpha = 0.948$), and the mean total moral-sensitivity score was 60.17 ± 13.04 ($n = 195$; $\alpha = 0.858$). Several moral-sensitivity subscales showed low internal consistency, with Cronbach's alpha values ranging from 0.182 to 0.531 for respect for patient autonomy, professional knowledge, experience of moral conflicts, and use of moral concepts (Table 1, Panel B).

Primary Total-Score Analysis

Among 185 participants with valid paired scores, total moral sensitivity showed no statistically significant association with total caring behaviors (Spearman's $\rho = -0.063$, 95% CI -0.205 to 0.082 ; $p = 0.396$). The Pearson sensitivity analysis yielded a similar result ($r = -0.081$, 95% CI -0.223 to 0.064 ; $p = 0.272$). Regression coefficients were also non-significant in the unadjusted model ($B = -0.062$, 95% CI -0.191 to 0.068 ; $p = 0.352$; $R^2 = 0.007$) and the adjusted model ($B = -0.072$, 95% CI -0.193 to 0.049 ; $p = 0.244$; $n = 178$; $R^2 = 0.247$; adjusted $R^2 = 0.187$) (Table 2, Panel A).

Table 2

Total-score and subscale associations between moral sensitivity and caring behaviors

Panel A. Association between total moral sensitivity and total caring behaviors					
Analysis	n	Estimate	95% CI	p value	Model information
Spearman rank correlation	185	ρ = -0.063	-0.205 to 0.082	0.396	Primary non-parametric analysis
Pearson correlation	185	r = -0.081	-0.223 to 0.064	0.272	Sensitivity analysis
Unadjusted robust linear regression	185	B = -0.062	-0.191 to 0.068	0.352	R ² = 0.007
Adjusted robust linear regression	178	B = -0.072	-0.193 to 0.049	0.244	R ² = 0.247; adjusted R ² = 0.187
Panel B. Spearman correlations between moral-sensitivity and caring-behavior domains					
Moral-sensitivity domain	Respecting others (CBI)	Assurance of human presence (CBI)	Positive connectedness (CBI)	Professional knowledge and skills (CBI)	
Respect for patient autonomy	-0.129; q = 0.094; n = 210	-0.117; q = 0.119; n = 218	-0.109; q = 0.143; n = 214	-0.135; q = 0.080; n = 218	
Relational knowledge	0.268*; q = 0.001; n = 199	0.195*; q = 0.011; n = 207	0.333*; q < 0.001; n = 203	0.263*; q = 0.001; n = 207	
Professional knowledge	-0.213*; q = 0.006; n = 208	-0.214*; q = 0.005; n = 216	-0.242*; q = 0.002; n = 212	-0.198*; q = 0.009; n = 216	
Experience of moral conflicts	-0.042; q = 0.568; n = 212	-0.126; q = 0.094; n = 220	0.010; q = 0.887; n = 216	-0.053; q = 0.472; n = 220	
Use of moral concepts	-0.176*; q = 0.023; n = 202	-0.224*; q = 0.004; n = 210	-0.181*; q = 0.019; n = 206	-0.250*; q = 0.002; n = 210	
Honesty and benevolence	-0.114; q = 0.135; n = 208	-0.096; q = 0.192; n = 216	-0.066; q = 0.390; n = 212	-0.179*; q = 0.018; n = 216	
Notes: Panel A reports the primary total-score analysis and sensitivity/regression analyses. Panel B cells show Spearman’s ρ; FDR-adjusted q value; valid n. *q < 0.05 after Benjamini–Hochberg correction. HC3 robust standard errors were used in regression analyses.					

Secondary Subscale-Level Analyses

After Benjamini–Hochberg correction, relational knowledge was positively associated with all four caring-behavior domains ($p = 0.195\text{--}0.333$; $q \leq 0.011$), with the strongest association observed for positive connectedness. Professional knowledge was inversely associated with all four caring-behavior domains ($p = -0.198$ to -0.242 ; $q \leq 0.009$), as was use of moral concepts ($p = -0.176$ to -0.250 ; $q \leq 0.023$). Honesty and benevolence was inversely associated only with professional knowledge and skills ($p = -0.179$; $q = 0.018$). Respect for patient autonomy and experience of moral conflicts showed no statistically significant associations after correction (Table 2, Panel B).

Exploratory Demographic and Occupational Analyses

After false-discovery-rate correction, total moral sensitivity differed according to physical activity ($q = 0.036$; $\varepsilon^2 = 0.034$), night-shift frequency ($q = 0.018$; $\varepsilon^2 = 0.062$), and interpersonal conflict ($q = 0.036$; $\varepsilon^2 = 0.047$). Nurses reporting no physical activity had higher scores than physically active nurses. Those working 4–8 night shifts per month had higher scores than nurses working 0–4 or more than 8 shifts, while nurses reporting high interpersonal conflict had lower scores than those reporting moderate or low conflict (Table 3).

Table 3
Exploratory demographic and occupational associations with total moral sensitivity

Panel A. Overall tests after false-discovery-rate correction					
Variable	Valid n	Overall test statistic	Raw p value	FDR q value	Effect size
Physical activity	195	H = 7.535	0.006	0.036	$\epsilon^2 = 0.034$
Night shifts/month	193	H = 13.857	< 0.001	0.018	$\epsilon^2 = 0.062$
Conflict with others	192	H = 10.887	0.004	0.036	$\epsilon^2 = 0.047$
Panel B. Holm-adjusted post-hoc comparisons					
Variable	Comparison	Group 1 median (IQR)	Group 2 median (IQR)	Cliff's delta	Holm-adjusted p
Physical activity	Yes vs No	55 (51–63)	61 (54–68)	-0.238	0.006
Night shifts/month	0–4 vs 4–8	56 (53–64)	63 (55–70)	-0.307	0.006
Night shifts/month	0–4 vs > 8	56 (53–64)	54 (51–63)	0.052	0.618
Night shifts/month	4–8 vs > 8	63 (55–70)	54 (51–63)	0.337	0.002
Conflict with others	High vs Moderate	49 (46–56)	59 (55–66)	-0.557	0.002
Conflict with others	High vs Low	49 (46–56)	60 (53–69)	-0.478	0.005
Conflict with others	Moderate vs Low	59 (55–66)	60 (53–69)	0.043	0.632
Notes: H, Kruskal–Wallis test statistic; ϵ^2 , epsilon-squared effect size; IQR, interquartile range. Cliff's delta direction follows Group 1 minus Group 2.					

Discussion

The primary analysis showed no statistically significant association between total moral sensitivity and total caring behaviors. This finding was consistent across Spearman and Pearson correlations and robust regression models. In contrast, the secondary analyses suggested a dimension-specific pattern: relational knowledge was positively associated with all caring-behavior dimensions, whereas professional knowledge and use of moral concepts showed inverse associations with several caring dimensions. Exploratory analyses also identified differences in moral sensitivity according to physical activity, night-shift frequency, and interpersonal conflict.

The total-score result differs from previous Iranian studies reporting positive associations between moral sensitivity and caring behavior [12, 15] and from a study among nursing interns in which empathy partially mediated this relationship [17]. Differences in populations, settings, measurement, and analytic strategies may contribute to inconsistent findings. Combining multidimensional constructs into total scores may also obscure dimension-specific associations.

Relational knowledge was the only moral-sensitivity dimension positively associated with all four caring-behavior domains. Relational knowledge reflects awareness of communication, interpersonal engagement, and ethical responsiveness in nurse–patient interactions. Its association with respecting, supporting, connecting with, and professionally caring for patients is therefore conceptually plausible and is consistent with evidence linking moral sensitivity and caring-related outcomes to empathy, emotional intelligence, and communication ability [13, 14, 17–19]. Nevertheless, these domain-level findings were secondary and require confirmation in adequately powered studies.

Professional knowledge and use of moral concepts were inversely associated with several caring-behavior dimensions. These findings should not be interpreted as showing that ethical knowledge reduces caring behavior. Possible explanations include more critical self-appraisal among ethically aware nurses, discrepancies between expected and achievable care under clinical constraints, or measurement-related instability. Several moral-sensitivity subscales had low internal consistency, which reduces confidence in the precision and reproducibility of these associations.

Night-shift frequency showed a non-linear relationship with moral sensitivity, with the highest scores among nurses working 4–8 night shifts per month. Exposure to ethically complex situations and fatigue are possible explanations, but these mechanisms were not measured. Greater interpersonal conflict was associated with lower moral sensitivity, consistent with the potential relevance of communication, teamwork, psychological safety, and ethical climate [20–25, 29–31]. The unexpected physical-activity finding may reflect residual confounding and should be considered hypothesis-generating.

False-discovery-rate correction and robust regression strengthened the analysis. The findings support further study of relational moral sensitivity and greater attention to communication, reflective practice, patient advocacy, teamwork, and supportive clinical environments.

Conclusion

Total moral sensitivity showed no statistically significant association with total caring behaviors, whereas relational knowledge was positively associated with all caring-behavior dimensions. The inverse associations involving professional knowledge and moral concepts require cautious interpretation because several subscales had low reliability. These findings suggest that the moral sensitivity–caring relationship may be dimension-specific and support further longitudinal research on relational ethics and modifiable workplace factors.

Limitations

Limitations include the cross-sectional design, which precludes causal or temporal inference, and potential recall and social-desirability biases from self-report. Recruitment from teaching hospitals affiliated with one university limits generalizability. Only 185 of 220 participants had valid paired total scores, and complete-case regression may have introduced selection bias if missingness was not random. Several moral-sensitivity subscales had low internal consistency, reducing confidence in domain-level estimates. The sample-size calculation addressed the primary total-score correlation rather than secondary or exploratory analyses. Residual confounding is possible because workload, staffing, burnout, moral distress, and ethical climate were not directly measured.

Abbreviations

CBI-16

Caring Behaviors Inventory-16

CI

Confidence interval

FDR

False discovery rate

HC3

Heteroskedasticity-consistent standard error estimator, type 3

MS

Moral sensitivity

SPSS

Statistical Package for the Social Sciences

Declarations

Ethics approval and consent to participate

This study was approved by the Ethics Committee of Isfahan University of Medical Sciences (IR.MUI.NUREMA.REC.1403.074). The study was conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from all participants. Participation was voluntary, and confidentiality of participants' information was maintained.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

Authors' information

Not applicable.

Additional Files

Additional file 1 (.docx). Title: Item Mapping Used to Calculate Instrument Domains. Description: Item allocation used to calculate the Caring Behaviors Inventory-16 and Moral Sensitivity Questionnaire domain-level scores.

Additional file 2 (.docx). Title: English-Language Version of the Demographic and Occupational Data-Collection Form. Description: English-language items and response categories for the study-specific demographic and occupational form.

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Author Contribution

SD and SAR contributed to conceptualization and methodology. DS and MM contributed to investigation and data collection. MSA and SAR contributed to data curation and formal analysis. SD and SAR drafted the manuscript. SD, DS, MM, KS, MSA, and SAR contributed to writing, review, and editing. All authors read and approved the final manuscript and agreed to be accountable for the work.

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Data Availability

The de-identified datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request and subject to approval by the relevant ethics committee.

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