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Development and psychometric properties of the nursing ethical decision-making ability scale

Xinyu Chen^{1†}, Chenxi Wu^{1†}, Wenting Ji^{1†}, Dingxi Bai¹, Huan Chen¹, Chaoming Hou^{1*} and Jing Gao^{1*}

Abstract

Background Nursing ethical decision-making ability is a core competency of nurses. However, no tool has been developed to measure the ethical decision-making ability of nurses in China. Therefore, we aimed to develop a nursing ethical decision-making ability scale (EDMAS) and assess its validity and reliability.

Methods A literature review, qualitative study, and the Delphi method were employed to identify the most common ethical dilemmas and original scale items. A cross-sectional study was conducted to evaluate the items. The reliability and validity of the scale were evaluated. Exploratory factor analysis (EFA) was employed to investigate the factor structure based on data from group 1 (N=404). Confirmatory factor analysis (CFA) was employed to assess the construct validity based on the data from group 2 (N=503). Convergent validity was evaluated using composite reliability (CR) and average variance extracted (AVE). Discriminant validity was assessed by analyzing the maximum shared variance (MSV). We invited 15 experts to evaluate the content validity of the EDMAS. This study was conducted between December 2021 and January 2023.

Results We defined 4 nursing ethical dilemmas and 71 original items. We deleted 4 items during the screening process. Additionally, 3 items were deleted from the EFA. The EFA revealed that the EDMAS with 64 items had a fourfactor structure (ethical sensitivity, motivation, judgment, and action), accounting for 56.05% of the total variance. The CFA revealed that $\chi^2/df = 1.291$, RMSEA = 0.024, CFI = 0.976, TLI = 0.974, NFI = 0.902, and IFI = 0.976. The CR values were between 0.945 and 0.964. The AVE values were between 0.583 and 0.588. The MSV values were between 0.533 and 0.572. The value of I-CVI varied from 0.867 to 1.000, and the S-CVI/Ave was 0.965. The Cronbach's of the scale was 0.982. The test–retest reliability of the EDMAS was 0.982.

Conclusion EDMAS is a reliable and valid tool for evaluating nurses' ethical decision-making ability and enhancing its ability through ethics training programs.

Keywords Nurse, Ethical decision-making ability, Scale, Exploratory factor analysis, Confirmatory factor analysis

[†]Xinyu Chen, Chenxi Wu and Wenting Ji contributed equally to this work.

*Correspondence: Chaoming Hou 19941012@cdutcm.edu.cn Jing Gao 19942021@cdutcm.edu.cn ¹ College of Nursing, Chengdu University of Traditional Chinese Medicine, No. 1166, Liutai Avenue, Wenjiang District, Chengdu, Sichuan Province 611137. China

Introduction

As medical technology advances rapidly with the increasing complexity of the work environment, nurses must meet the needs of patients and their families while fulfilling the requirements of teamwork and hospital administration [1, 2]. Consequently, nurses encounter various ethical problems, including ethical dilemmas or distress, more rapidly and inevitably than other healthcare professionals [3, 4]. Previous studies demonstrated that nurses

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experienced moral distress at moderate or higher levels [5, 6]. Of all ethical problems nurses encountered, more than half remained unresolved [7]. Prolonged confusion among nurses regarding ethical problems would impact their ability to remain engaged, constructive, and non-reactive, leading to diminished nursing quality and jeopardizing the health of patients [8, 9]. Rational ethical decision-making is inseparable from the health outcomes of patients and concurrently aids nurses in avoiding mental and physical disorders [10, 11].

Nursing ethical decision-making is characterized as a systemic process involving professional accountability and moral components, enabling the formulation of the most appropriate decision regarding an ethical issue based on intuition, ethical nursing principles, codes of ethics, and moral reasoning in clinical nursing practice [11, 12]. Previous studies have demonstrated that ethical decision-making ability in nursing is closely associated with the quality of nursing care and the nurse-patient relationship [11, 13]. Fostering ethical decision-making skills is crucial for enhancing the clinical competencies of nurses [14]. It is imperative to have a validated tool to evaluate the ethical decision-making competencies of nurses to achieve this, followed by the implementation of targeted interventions to improve their ethical decisionmaking skills in nursing practice based on the assessment outcomes.

Various tools have been created to evaluate different aspects of ethical decision-making competencies in healthcare professionals across diverse cultural settings [15–17]. Tools, including those developed by Hébert PC et al. [18] and Pai et al. [19] focus on assessing the ethical sensitivity or decision-making competence of medical and nursing students, while Crisham developed an instrument to evaluate the moral judgment of nurses [16], and Ketefian developed the judgment about nurses' decisions to measure nurses' ethical behaviors [20]. Due to the varying cultural backgrounds and medical environments, nurses encounter ethical dilemmas or distinct ethical issues and address them according to different ethical principles or ethical values [21, 22]. These tools may inadequately address the specific ethical dilemmas encountered by nurses in distinct healthcare settings in China, and a gap remains in the availability of a tool specifically tailored to assess nursing ethical decisionmaking competencies in China. It is imperative to create a dependable instrument based on unique cultural backgrounds and healthcare challenges for assessing the ethical decision-making capabilities of nurses in China.

According to Rest's four-component model, making ethical decisions is recognizing an ethical issue and implementing justifiable behavior [23]. It included ethical sensitivity, judgment, motivation, and action, which are the core abilities of ethical decision-making. All four core abilities are interactional: information processing, design, choice, and inspection [24]. Emphasis on the process of thinking and the actions that accompany [25]. Furthermore, the four abilities were consistent with the definition of ethical ability, which included the ability to recognize ethical situations and make judgments and the willingness to act in the best interest of patients [26, 27]. However, as Katayama H et al. stated, the above did not include specific methods that nurses could use in clinical practice [25].

Terry L. Cooper developed an ethical decision-making model that involves describing the situation, defining ethical problems, analyzing alternative methods, considering potential consequences, and selecting the best action strategy [28]. Cooper's ethical decision-making model provided direct thinking, action skills, and methods for resolving ethical issues. Simultaneously, it revealed the required information, design, selection, and inspection characteristics consistent with the connotations of Rest's four-component model [28]. For instance, we can improve our ethical sensitivity by describing our situation and making an ethical decision based on alternative methods and potential consequences. Rest's fourcomponent model stated the core components of ethical decision-making abilities, and Cooper's ethical decisionmaking model stated the specific thinking and doing methods for demonstrating ethical decision-making abilities.

Accordingly, we aimed to create a nursing ethical decision-making ability scale based on Rest's four-component and Cooper's ethical decision-making models. Furthermore, Palermo J et al. reported that respondents had to be placed in the context of an ethical dilemma to reflect the influence of individual value on ethical decisionmaking [29]. Therefore, we expanded our scale to include representative ethical dilemmas in nursing practice. Besides, this study will assess the reliability and validity of the EDMAS using data from nurses in China. Hence, we hope to provide a tool that can effectively evaluate and improve the ethical decision-making skills of nurses in China, thereby improving patient care and supporting the professional development of nurses.

Methods

Design of study

This study was conducted between December 2021 and January 2023. The study comprised three components: (1) generating ethical dilemmas in nursing and original items through literature review, qualitative interview, and the Delphi method; (2) items screening; (3) testing of the scale's validity and reliability.

Sample size

Participants for the qualitative interviews were recruited from hospitals in Sichuan Province, China, using purposive sampling. The interviews continued until data saturation was achieved, as the sample size for qualitative studies could not be predetermined [30]. The inclusion criteria included (1) registered clinical nurses with at least one year of work experience and who have received education and training in nursing ethics; (2) nurses who provided informed consent and voluntarily agreed to participate in the study. The exclusion criteria included (1) nurses who were not on duty during the study period and (2) nurses undergoing training, further education, or rotation.

To evaluate the items and assess the validity and reliability of EDMAS, we performed cross-sectional studies in two stages: the samples for stage one (Group 1) were utilized to screen the items and execute exploratory factor analysis. The sample size was determined based on existing guidelines, which recommend 100 to 250 participants [31]. In our study, we set the minimum sample size for EFA at 250. Considering the 30% missing values, we ensured the sample size of Group 1 was 357. Simultaneously, samples from stage two (Group 2) were collected to analyze the CFA, CR, AVE, and MSV. The literature indicates that the sample size for conducting CFA should be < 300 [32]. The adjusted sample size of Group 2, which accounts for a 30% increase due to missing values, was 429. The inclusion criteria for the two-stage survey included (1) registered clinical nurses and (2) nurses who provided informed consent and voluntarily agreed to participate in the study. The exclusion criteria included (1) nurses who were not on duty during the study period and (2) nurses undergoing training, further education, or rotation.

Generating ethical dilemmas in nursing and original items We employed a literature review, qualitative interview, and the Delphi method to obtain the ethical dilemma scenarios and original components of EDMAS. We included 14 clinical nurses from hospitals in the qualitative interview, which followed these outlines: (1) What ethical dilemma have you encountered in your nursing duties that you were uncertain how to address? (2) What aspect of this ethical dilemma was particularly challenging? (3) What did you believe was the initial approach to address this ethical dilemma? (4) What actions can be taken regarding this matter? What motivated you to undertake this? (5) Could you please elaborate on the process of solving this problem and explain the rationale behind your chosen approach?. We collected the audio recordings and notes within 24 h after the interview.

We identified four ethical dilemma scenarios within clinical nursing practice: the ethical dilemmas between nurses and doctors, nurses and nurses, nurses and patients, and nurses and nursing management, respectively. Furthermore, according to different ethical dilemmas, we obtained 71 original items from literature, interviews, and the Delphi method that aligned with the principles of Cooper's ethical decision-making model. Each ethical dilemma would evaluate nurses' ethical decision-making ability from four aspects: ethical sensitivity, judgment, motivation, and action, which was in keeping with the meaning of Rest's four core ethical decision-making abilities. The final score reflected their overall ethical decision-making capabilities. Participants assessed their ethical decision-making abilities using a 5-point Likert scale with ratings ranging from 1 very low to 5 very high per item. 1=strongly oppose, 2=oppose, 3 = neutrality, 4 = agree, and 5 = strongly agree. However, items marked with an asterisk are scored in reverse. Higher scores indicate a higher level of ethical decisionmaking abilities.

Screening of items

We employed the critical ratio method (retaining items with P < 0.05), correlation analysis (retaining items with a correlation coefficient ≥ 0.4), discrete trend analysis (retaining items with standard deviation ≥ 0.08), and Cronbach's coefficient method (retaining items if the Cronbach's α of the total scale decreased upon their deletion) to filter the scale items. If an item was recommended for deletion by more than two of the four methods above, it would be removed [33].

Testing the validity and reliability of the scale *Validity*

Construct validity was assessed using EFA and CFA. The EFA was performed to evaluate the factor structure. Items with a factor loading < 0.4 or those under factors with fewer than three items were eliminated [34]. For CFA, the maximum likelihood confirmatory factor analysis was used to examine the underlying latent variable structure of the EDMAS. The chi-square/degree of freedom (χ^2/df) , root mean square error of approximation (RMSEA), comparative fit index (CFI), tucker-Lewis Index(TLI), normalized fit index(NFI), and incremental fit index(IFI) were employed to assess the goodness of model fit. The acceptable fit indices were: $\chi^2/df < 3$, RMSEA < 0.08, CFI > 0.90, TLI > 0.90, NFI > 0.90, and IFI>0.90 [35]. Convergent validity was evaluated using CR and AVE. A CR value >0.7 and an AVE value >0.5 indicated acceptable convergent validity. Discriminant validity was evaluated by examining MSV, where MSV values must be less than the corresponding AVE values

for each construct to demonstrate adequate discriminant validity [36].

The content validity was assessed by a panel of 15 experts, comprising three experts from clinical nursing, six from medical or nursing ethics, three from nursing management, and three from scale development. Experts evaluated each item of the EDMAS using a 5-point Likert-type scale based on relevance to nursing ethical decision-making ability to the associated category: 1=not relevant, 2=somewhat relevant, 3=relevant, but needs minor changes, and 4=very relevant. The content validity index for the scale items (I-CVI) was calculated by assessing the ratio of items rated 3 or 4 by all the experts. Furthermore, the average scale content validity index(S-CVI/ave) was calculated by the average of all I-CVI. According to the recommendation, the I-CVI>0.83 and S-CVI/Ave>0.90 were acceptable [36].

Reliability

Internal consistency reliability was evaluated using Cronbach's α coefficient. An alpha value > 0.7 was deemed acceptable [37]. The 2-week test-retest reliability was evaluated by calculating the correlation coefficient. The test-retest reliability was considered sufficient when the intraclass correlation coefficient (ICC) values exceeded 0.70 [38].

Ethical considerations

This study was approved by the ethics committee of Jinniu District People's Hospital of Chengdu with approval number (QYYLL-2024–13). All aims and methods of this study were explained to all the participants. The methods were performed in accordance with the applicable guidelines and regulations (Helsinki Declaration), and all participants provided written informed consent.

Statistical analysis

Statistical Package for the Social Sciences software (version 24.0) and AMOS software (version 24.0; SPSS Inc., Chicago, IL, USA) were used for the statistical analyses. Quantitative variables are presented as mean (standard deviation), and categorical variables are presented using frequency. The psychometric process included the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity to evaluate the suitability of the data for exploratory factor analysis. P < 0.05 was considered statistically significant.

Results

Characteristics of participants

Group 1 comprised 49 (12.13%) male nurses and 355 (87.87%) female nurses. Group 2 comprised 55 (10.90%) males and 448 (89.10%) females who were recruited.

Among the two groups, most of the nurses were 18–40 years old.

Generation of nursing ethical dilemmas and original items After the literature review, qualitative interview, and Delphi expert consultation, the original version of EDMAS was developed, comprising 4 nursing ethical dilemmas and 71 items.

Screening of items

We employed the critical ratio method, correlation analysis, discrete trend analysis, and Cronbach's coefficient method to screen items. During the item screening process, 4 items were simultaneously recommended for deletion by three of the four methods above. We developed the preliminary version of EDMAS comprising 4 nursing ethical dilemmas and 67 items.

Assessment of the scale's validity and reliability Validity

The principal components extraction method of EFA with varimax rotation was employed to assess the construct validity of the initial version of EDMAS. The results revealed that the KMO was 0.959 (P < 0.01), indicating the significance of the factor analysis model. Additionally, 3 items were removed because there were < 3 items under the factor. The results of the second-time EFA revealed that the four-factor solution accounted for 56.05% of the total variance and comprised 64 items: ethical motivation, ethical judgment, ethical sensitivity, and ethical action, which explained 14.975%, 13.733%, 10.581%, and 16.764% of the variance, respectively. Table 1 presents the factor loadings. Furthermore, CFA was performed to evaluate the goodness-of-fit of EDMAS. The results revealed that $\chi^2/df = 1.291$, RMSEA = 0.024, CFI = 0.976, TLI=0.974, NFI=0.902, and IFI=0.976. The standardized path coefficients for all items were > 0.4. Figure 1 depicts the final model. Furthermore, the results indicate that the AVE values for the four dimensions exceeded 0.50, while the CRs surpassed 0.90. Additionally, the MSV for each dimension was > 0.50 but was smaller than the AVE value of this dimension. Table 2 displays the AVEs, CRs, and MSVs values of the final EDMAS model.

We invited 15 experts to identify the content validity of the EDMA with 64 items. The results revealed that the value of I-CVI varied from 0.867 to 1.000, and the S-CVI/ Ave was 0.965 (Table 3).

Reliability

Table 4 presents the descriptive statistics for the scale and dimension. Cronbach's α for EDMAS exhibited high internal consistency, yielding an alpha coefficient of 0.982 for the total instrument. All Cronbach's α values for

Table 1 Final component rotated matrix of the EDMAS and its items' loading

Items		Factors loadings			
	1	2	3	4	
Dimension 1: Ethical sensitivity					
1. I will check with the doctor about the situation	0.639				
2. ^a The patient said the doctor believed it was OK to inject, so I do not have to/do not want to check	0.670				
3. I will try to understand the reason why the patient insists on injecting the drug	0.786				
4. I think there is a risk of conflict with the patient in this situation	0.685				
5. I believe there is a risk that this scenario will harm the patient's health and cause adverse events	0.587				
19. I will ask Xiao Li why she does not want to report it	0.758				
20. I will observe the patient's physical condition again	0.736				
21. I think this situation may damage my working relationship with Xiao Li	0.662				
22. In my opinion, there is a risk that this scenario will violate the relevant management system of the hospital	0.544				
35. I will review and evaluate the patient's physical condition, treatment, and other information	0.728				
36. I will abandon conventional thinking, try to obtain as much information as possible about the patient's condition, and actively participate in the decision-making process	0.704				
37. I think there is a risk of conflict with the patient or family in this scenario	0.721				
38. I think there is a risk that the patient's condition will be affected by this scenario	0.682				
51. ^a My colleague has told me the relevant information, so there is no need to know the specific situation	0.701				
52. ^a There is so much work that needs to be done that I have little time or energy to find new information	0.687				
53. I will confirm with the doctor and head nurse whether they are aware of the patient's relevant situation	0.690				
54. I consider that there is a risk to the life of the patient in this scenario	0.711				
55. I consider that there is a risk of a breach of professional norms in this scenario	0.684				
Dimension 2: Ethical motivation					
6. Respect patient autonomy		0.725			
7. Avoid nurse-patient conflict		0.682			
8.ª Do not question your doctor's treatment decisions		0.718			
9. Avoid damaging patients' health and causing adverse events		0.718			
23. Prevent Xiao Li from blaming or punishing		0.751			
24. Avoid blaming or punishing Xiao Li for this		0.812			
25.ª Avoid being incriminated		0.731			
26. Protect patients from harm		0.731			
39. ^a Avoid saying the wrong thing and getting myself into trouble		0.707			
40. Avoid compromising patients' right to know		0.694			
41. Avoid causing harm to patients and harming their lives and health		0.696			
42.ª Avoid disobeying family requests		0.735			
56. ^a Able to complete my work on time		0.669			
57. Not violate the relevant rules and regulations		0.719			
58. Not harm the life and health of patients to avoid adverse events		0.715			
Dimension 3: Ethical judgment					
10. ^a I take the advice and suggestions from my colleagues directly			0.674		
11. I will propose various solutions and envisage the possible consequences			0.841		
12. ^a I have little time or energy to examine the consequences of my choices			0.662		
13. I will communicate and weigh with my colleagues and try to be as clear as possible about the conse- quences of various solutions			0.709		
27. I will try to find as many solutions as possible, taking into account the latest or seemingly unworkable ones			0.690		
28. I will try to listen to the suggestions and opinions of other colleagues as much as possible			0.671		
29. Before I make a decision, I will try to consider the consequences as much as possible			0.690		
43. ^a The patient's attitude left me no time to think of more ways to deal with the problem			0.682		

Table 1 (continued)

Items		Factors loadings			
	1	2	3	4	
44. ^a When a mentor (doctor, head nurse, or someone with more experience than me) recommends an option, I adopt it without considering other ways to solve the problem			0.691		
45. When faced with similar problems, although others have done the same, I will still make assumptions about the possible consequences			0.693		
59. ^a Other colleagues have done this, and I do not think I can find another solution			0.654		
60. I usually start with "If I do this, I will" The way to consider the consequences of all alternatives			0.681		
Dimension 4: Ethical action					
14. ^a I will explain to the patient the risks of injecting the drug, and if the patient insists on injecting the drug, I will ask him to write a statement and sign a certificate				0.691	
15. ^a I will refuse the injection and refer the patient to the doctor				0.796	
16. ^a I will inject the patient with this drug, but for fear of accidents, after the patient leaves the hospital, I will instruct the patient to observe for 30 min and subsequently leave				0.734	
17. I will refuse to inject the drug, and after explaining to the patient, we will communicate with the doctor and ask the doctor to issue a new medical order				0.701	
18. ^a Since the doctor says yes, there should be no problem; I do not want to check and give the patient the drug directly				0.694	
30.ª It is recommended that Xiaoli continue to pay attention to the patient's physical condition first and do not report if there is no abnormality, and then report if there is an abnormality				0.717	
31. Tell Xiao Li the severity of adverse reactions in case of patients, and then help her report together				0.704	
32. ^a It is suggested that Xiao Li consult the head nurse before deciding whether to report				0.727	
33. Tell Xiao Li to bear the ethical responsibility for her medical errors and draw lessons to avoid more mistakes in the future, and suggest that Xiao Li take the initiative to report				0.700	
34.ª Do not give any opinions; just tell Xiao Li to respect any decision she makes				0.699	
46.ª My experience does not allow me to judge whether I have made the right decision. I will tell the patient that she is not sure about her condition and ask her to ask another nurse or doctor				0.739	
47. ^a Because family repeatedly told me not to tell the patient about her condition, I chose not to tell the patient about her real condition				0.682	
48. I will make an assessment. If the patient is not suitable to know the true condition, I will hide it from her to prevent her condition from getting worse after she knows the truth and threatening her life safety				0.688	
49. ^a Because the patient has a firm attitude, I choose to tell the patient about her condition				0.721	
50. I will evaluate the patient first, and if the evaluation results support it, I will respect the patient's right to know and inform her of her true condition to help the patient spend her final time better				0.713	
61. ^a In order to complete my work, I would choose to continue to use propofol on the patient				0.697	
62.ª Other colleagues have given the patient propofol, so can I				0.709	
63.ªI will inform the head nurse that there are not enough nursing staff to ensure the safety of the nursing work, act on the head nurse's advice, and state that I will not be liable if the patient has an accident				0.684	
64. I will re-evaluate the needs of patients and coordinate with colleagues to solve the critical situation in the current situation				0.749	
Percentage of variance explained	14.975%	13.733%	10.581%	16.764%	
The total percentage of the factor model	56.05%				

"a" means that this item takes reverse scoring

EDMAS dimensions and the total scale were >0.90. The 2-week test-retest reliability was assessed by calculating the ICC. Of the 503 participants, 26 were randomly selected and asked to answer the survey again 2 weeks later. The correlation coefficient for the total EDMAS was 0.982, while the correlation coefficient for each dimension varied between 0.961 and 0.982. We produced the final version of EDMAS with good validity and reliability (Supplementary File 1).

Discussion

Nursing ethical decision-making requires nurses to approach ethical dilemmas from an ethical nursing perspective, develop solutions, and apply nursing ethics theories, principles, and standards to practice [39]. Nursing ethics issues inherently encompass value judgments and cultural selections, reflecting the ethnic and cultural influences shaped by a society's development and transformation [40]. Consequently, in developing



Fig. 1 Model of the 64-item EDMA with standardized regression weights and correlations. Note: F1: ethical judgement; F2: ethical motivation; F3: ethical sensitivity; F4: ethical action

Table 2 The AVEs, CRs, and MSVs values of the final EDMAS model

Dimension	CR	AVE	MSV
Ethical sensitivity	0.962	0.583	0.572
Ethical motivation	0.955	0.588	0.566
Ethical judgment	0.945	0.588	0.533
Ethical action	0.964	0.584	0.572

the EDMAS, we identified ethical dilemmas reflective of China through a literature review and qualitative interviews with Chinese nurses, ensuring that the content of the scale was congruent with the medical, ethical, and cultural context of China.

According to the results of the Delphi method and items screening, 4 nursing ethical dilemmas and 67 items were retained. The EFA and CFA were utilized to confirm the construct validity of the instrument. We developed a reliable and valid 64-item EDMAS with four nursing ethical dilemmas in China, from which three items were eliminated during the exploratory factor analysis. Four factors were identified: ethical sensitivity, motivation, judgment, and action, respectively.

Ethical sensitivity represents the ability of nurses to identify ethical issues [41]. Studies stressed that ethical sensitivity played a key role in clinical ethical

ltem	Number of experts with scoring for 3 or 4	I-CVI	ltem	Number of experts with scoring for 3 or 4	I-CVI
Ethical sensitivity			Ethical judgment		
1	15	1	10	15	1
2	15	1	11	15	1
3	14	0.933	12	14	0.933
4	14	0.933	13	15	1
5	13	0.867	27	15	1
19	10	1	28	14	0.933
20	10	1	29	15	1
21	14	0.933	43	14	0.933
22	15	1	44	15	1
35	14	0.933	45	14	0.933
36	15	1	59	15	1
37	14	0.933	60	15	1
38	14	0.933	Ethical action		
51	13	0.867	14	14	0.933
52	15	1	15	13	0.867
53	15	1	16	15	1
54	15	1	17	15	1
55	14	0.933	18	15	1
Ethical motivation			30	13	0.867
6	15	1	31	14	0.933
7	15	1	32	15	1
8	14	0.933	33	15	1
9	15	1	34	14	0.933
23	14	0.933	46	13	0.867
24	13	0.867	47	15	1
25	14	0.933	48	15	1
26	15	1	49	14	0.933
39	15	1	50	15	1
40	15	1	61	14	0.933
41	15	1	62	14	0.933
42	14	0.933	63	15	1
56	14	0.933	64	15	1
57	15	1	-	-	-
58	15	1	-	-	-

Table 3 Index expert scores for content validity (n = 15)

 Table 4
 Descriptive information of EDMAS dimensions and reliability

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Total/dimension	Number of items	Min-max	Mean ± SD	Cronbach's a	Test– retest reliability
Total	64	90.00–297.00	216.33±45.31	0.982	0.982
Ethical sensitivity	18	23.00-85.00	60.36 ± 14.36	0.962	0.960
Ethical motivation	15	18.00-73.00	50.75±13.12	0.955	0.982
Ethical judgment	12	16.00-58.00	41.04 ± 9.85	0.945	0.976
Ethical action	19	26.00-91.00	64.11±15.15	0.964	0.961

decision-making and the execution of ethical action [42, 43]. An instrument was developed to assess the degree of ethical sensitivity [42]. However, the moral sensitivity questionnaire (MSQ), developed by Kim Lützén, primarily evaluates the capability of the nurse to perform a task rather than the methodology for executing it. For instance, "I am keen to discern when a patient is not receiving adequate care." Ethical motivation refers to the ability of nurses to ascertain their subjective intention of action from an ethical standpoint when confronted with ethical dilemmas. Ethical judgment is the ability of nurses to evaluate multiple alternative solutions to ethical dilemmas and to anticipate the consequences of each solution. It aids in recognizing potential risks and benefits through evidence-based analysis [19]. Ethical action refers to the ability of nurses to select the optimal course of action based on moral principles and ethical guidelines. The study demonstrated that ethical behavior can enhance the motivation of nurses, establish them as role models for peers, foster a sense of safety, and empower them [44]. Sahin S et al. developed a scale to assess the ethical conduct of nurses based on five dimensions: attitude, ethical values, behavior, patient safety, and belief [45]. The objective of the scale paralleled our scale, both focusing on whether nurses adopt ethical action in clinical practice. The ethical actions in our study were designed for specific ethical dilemmas. They included non-ethical behaviors, including pro-organizational non-ethical behaviors, to more effectively assess whether nurses can engage in ethical behaviors when confronted with ethical dilemmas.

Rest developed the four elements of ethical sensitivity, motivation, judgment, and action in our study. In addition to the instruments mentioned above that evaluated one of the four components, tools were developed to assess all four components. For instance, the Ethical Caring Competency Scale developed by Katayama et al. for nurses [25] and the Ethical Decision-making Competence Scale developed by Pai et al. for nursing students [19]. Furthermore, the content of the measurement tool and the application population were not identical to our study; EDMAS was developed based on Cooper's ethical decision-making model [28] and Rest's four-component model [46]. The utilization of both theories offers a comprehensive framework that encompasses theoretical and practical components, enabling EDMAS to encapsulate the intricacies of ethical decision-making by combining fundamental ethical competencies with implementable strategies.

Our study indicated that nurses in China possess superior ethical decision-making abilities. Several studies have demonstrated that suitable educational methods can significantly enhance nursing ethical decision-making and mitigate the adverse effects of ethical dilemmas. Kim et al. [47] reported that utilizing frequent ethical dilemmas in clinical practice as subjects for debate significantly enhances the ethical judgment skills of trainees compared to conventional didactic teaching methods. The interprofessional ethics course created by Sedgwick et al. [48] offers significant insights on nursing ethics for continuing education programs in China. Gazarian et al. [49] recommended employing digital storytelling methods-including computer-generated stories, music, video clips, and text-to enhance nurses' awareness of their advocacy roles. Wheeler et al. [50] reported that developing reflective practice storytelling guidelines helped nursing students better understand reflective professional practice, thereby improving their communication, teamwork, and ethical skills. In the future, additional measures should be taken to improve the ethical decision-making ability of nurses.

Limitations

First, we used convenience sampling to recruit the participants, which may limit the generalizability of the findings. This sampling method may introduce selection bias, as participants may have different characteristics than those who do not, potentially compromising the external validity of the results.

Conclusion

Our study developed a unique tool to assess the ethical decision-making ability of nurses in China and evaluated the psychometric characteristics of EDMAS. The scale quantitatively evaluates nursing decision-making ability across four aspects: ethical sensitivity, motivation, judgment, and action. The instrument demonstrates satisfactory internal consistency, reliability, robust content, and construct validity. Employing EDMAS to investigate nurses' ethical decision-making ability could reveal the lack of vulnerable abilities in their decision-making processes regarding ethical dilemmas. Nursing educators and administrators can utilize the findings to perform focused ethical training.

Abbreviations

edmas	Ethical Decision-making Ability Scale
EFA	Exploratory Factor Analysis
CFA	Confirmatory Factor Analysis
CR	Composite Reliability
AVE	Average Variance Extracted
MSV	Maximum Shared Variance
RMSEA	Root Mean Square Error of Approximation
CFI	Comparative Fit Index
TLI	Tucker-Lewis Index
NFI	Normalized Fit Index
FI	Incremental Fit Index
-CVI	Content Validity Index for the Scale Items
S-CVI/ave	Average Scale Content Validity Index
CC	Intraclass Correlation Coefficient
KMO	Kaiser–Meyer–Olkin

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12910-025-01190-9.

Supplementary Material 1.

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None.

Authors' contributions

J G and C H were responsible for the study conception and design. X C, C W, and W J were responsible for project implementation, data collection, data analysis and drafting of the manuscript, and they contributed equally to this article. D B and H C made critical revisions to the paper for important intellectual content. X C, C W, and W J made the equal contribution to this article.

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Data availability

All the data will be available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

This study was approved by the ethics committee of Jinniu District People's Hospital of Chengdu with approval number (QYYLL-2024–13). All aims and methods of this study were explained to all the participants. The methods were performed in accordance with the applicable guidelines and regulations (Helsinki Declaration), and all participants provided written informed consent.

Consent for publication

All the participants and patients in our study gave written informed consent for their personal and clinical details along with any identifying images to be published in this study.

Competing interests

The authors declare no competing interests.

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