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3C Guided Reflection Combined with Scenario Simulation Enhances Humanistic Care Ability Among Nursing

Students: A Mixed Methods Study

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Abstract

Background: Humanistic care is the essence of nursing practice. However, nursing education currently faces challenges including monotonous training methods and disconnection between theory and practice, highlighting the urgent need to explore effective new teaching models. Based on reflective practice theory, this study aims to examine the effects of 3C (Context, Content, Course) guided reflection combined with scenario simulation teaching on the humanistic care ability of undergraduate nursing students.

Methods: A sequential explanatory mixed methods design was employed. In the first phase, 350 undergraduate nursing students enrolled in 2024 at a medical university in Guizhou Province were randomly assigned to an experimental group ($n = 200$) or control group ($n = 150$) using cluster random sampling. The experimental group received integrated teaching consisting of "theoretical instruction + scenario simulation + 3C guided reflection," while the control group received traditional theoretical instruction. The Caring Ability Inventory, theoretical knowledge tests, and satisfaction questionnaires were used for outcome evaluation. In the second phase, 40 nursing students were purposively selected from the experimental group for semi-structured in-depth interviews, and data were analyzed using thematic analysis.

Results: Following the intervention, the experimental group demonstrated significantly higher total scores of humanistic care ability (194.63 ± 12.85 vs. 173.96 ± 10.58) and scores across all dimensions (understanding, courage, patience) compared to the control group (all $P < 0.0001$). Theoretical test scores were also significantly higher in the experimental group (71.71 ± 18.14 vs. 67.80 ± 20.69 , $P < 0.05$), and students reported high levels of classroom satisfaction. Qualitative analysis revealed four core themes: deep awakening of empathy, 3C feedback as a scaffold for cognitive reconstruction, courage cultivation in a safe environment, and internalization of care into professional identity.

Conclusion: The 3C guided reflection combined with scenario simulation teaching model, grounded in reflective practice theory, effectively enhances the humanistic care ability and theoretical knowledge of undergraduate nursing students. By constructing a

complete "experience-reflection-abstraction" learning cycle, this model promotes the internalization of humanistic care from external requirements into stable professional competencies, providing both theoretical and practical evidence for nursing humanities education reform.

Keywords: 3C guided reflection; Scenario simulation; Humanistic care ability; Reflective practice; Mixed methods study; Nursing education

Introduction

Nursing is a profession that integrates scientific rigor with humanistic artistry, with its core residing in caring for life and dignity[1]. Since the American Nursing League established humanistic care as the core of nursing education in the 1980s, the global nursing education community has continuously explored effective pathways for cultivating this competency[2]. China's "Action Plan for Enhancing Medical Humanistic Care (2024-2027)" further emphasizes the need to deeply integrate humanistic care concepts throughout the entire process of nursing talent cultivation[3]. Undergraduate nursing students, as the backbone of the future nursing workforce, directly influence the quality of nursing services and patient health outcomes through their humanistic care ability; therefore, strengthening this ability among nursing students is imperative[4]. However, nursing education currently faces practical challenges in cultivating humanistic care. Although traditional experiential teaching and problem-based learning (PBL) models have demonstrated certain effects, they remain insufficient in promoting deep integration of authentic clinical scenarios with humanistic concepts and systematically cultivating students' caring practice abilities, often resulting in superficial and formalized humanities education[5, 6]. To better enhance nursing students' humanistic care ability, educators continue to explore and pursue more effective teaching approaches.

This study employs Schön's reflective practice theory[7] as its framework, designing 3C guided reflection as the core component of scenario simulation teaching. Through three structured steps" Context analysis—Content exploration—Course reflection" students are guided to engage in "reflection-on-action" regarding their simulation experiences, Transform specific experiences into transferable practical wisdom. Boud and colleagues further emphasized that reflection serves as a critical bridge connecting concrete experience with meaning construction, facilitating learners' generation of personalized professional knowledge through experience[8]. Based on this theoretical perspective, 3C feedback functions as an operational tool for reflective practice, working synergistically with the embodied experiences provided by scenario simulation to jointly promote effective integration of humanistic care knowledge, emotions, and behaviors. This accelerates their transformation from explicit cognition to implicit professional competence, helping students construct an integrated clinical decision-making framework that balances scientific rationality with humanistic warmth. To comprehensively evaluate the effects of this teaching model, this study adopted a sequential explanatory mixed methods design: first examining its intervention effects on students' humanistic care ability and theoretical performance through a randomized

controlled trial, followed by in-depth qualitative interviews exploring students' internal experiences and the mechanisms underlying ability changes, thereby providing empirical evidence for theoretical innovation and practical reform in nursing humanities education.

1. Objects and Methods

1.1 Study Design

This study employed a sequential explanatory mixed methods design. The first phase consisted of a cluster randomized controlled trial aimed at evaluating the objective effects of the teaching intervention. The second phase involved purposive sampling for qualitative research, aimed at deeply understanding the intervention's mechanisms and students' experiential processes.

1.2 Quantitative Study

1.2.1 Study Participants

This study has received ethical approval, A total of 350 undergraduate nursing students enrolled in 2024 at a medical university in Guizhou Province, China were selected as study participants, Ethics approval and consent to participate. Inclusion criteria were: (1) full-time first-year nursing students; (2) voluntary participation with signed informed consent. Exclusion criteria were: (1) previous participation in similar educational reform projects; (2) long-term leave during the study period. Using cluster random sampling, students were divided into an experimental group($n = 200$) and a control group($n = 150$). There were no statistically significant differences in baseline characteristics such as age, gender, or entrance examination scores between the two groups ($P > 0.05$).

1.2.2 Teaching Methods

Both groups studied Chapter 10, "Nursing Scientific Thinking Methods and Decision-Making," from Li Xiaomei's "Introduction to Nursing" (4 teaching hours total), implemented by the same teaching team during the first semester. Instructors and teaching syllabi were identical. Theoretical instruction was delivered by full-time faculty, covering the composition and application of critical thinking and the development of clinical nursing decision-making abilities, while simultaneously integrating humanistic care ability cultivation throughout all teaching components to help students enhance their humanistic professional competence while mastering scientific thinking and decision-making methods.

1.2.2.1 Control Group Teaching Methods

The control group received traditional teaching primarily based on theoretical lectures. Instructors systematically explained relevant knowledge points according to the teaching syllabus, supplemented with specific cases to help students understand and absorb theoretical knowledge. A free question session was provided where instructors answered students' questions individually. After completing the chapter, students took a theoretical test. Instructors analyzed overall test performance based on feedback from the Chaoxing Learning Platform, providing detailed feedback to students and conducting further interactive Q&A through class groups.

1.2.2.2 Experimental Group Teaching Methods

The experimental group received an integrated model combining 3C guided reflection with scenario simulation teaching. The specific teaching process is shown in Figure 1.

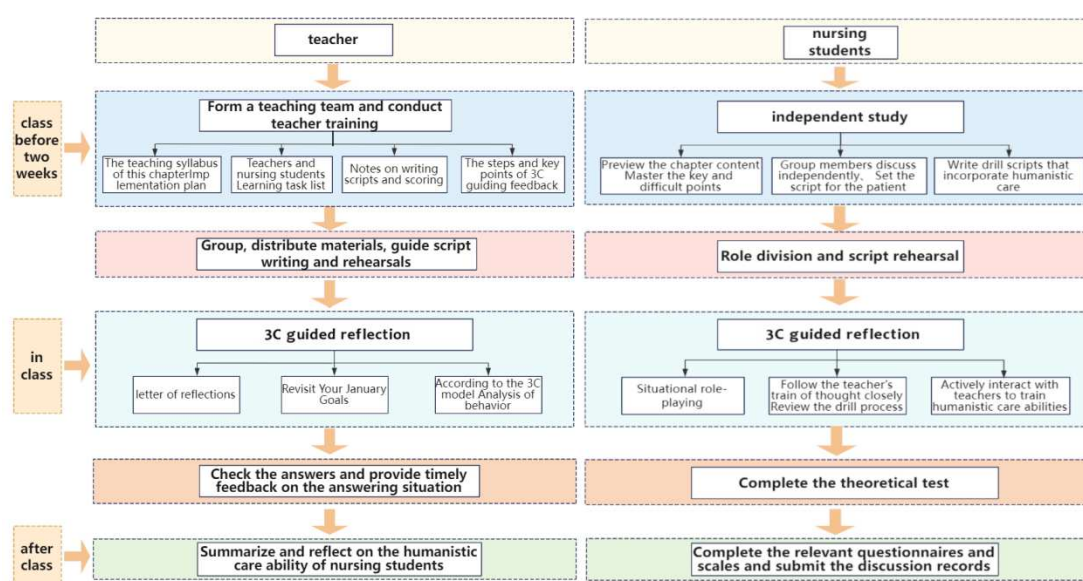


Figure 1: The flowchart of the teaching method in the experimental group

(1) Pre-class Preparation (2 weeks before class)

① **Teacher Team Formation:** The teacher team consisted of 11 members, including 1 full-time teacher, 2 clinical teachers, and 8 nursing graduate students. Clinical teachers were responsible for developing scenario simulation scoring criteria. Nursing graduate students designed teaching effectiveness evaluation questionnaires. The full-time teacher, a master's supervisor, conducted pre-class teacher training, explained teaching content, and prepared theoretical test questions.

② **Teacher Training:** The teaching team received systematic training in 3C feedback techniques and scenario simulation guidance strategies to ensure proficiency in implementing this teaching model.

③ **Teacher Preparation:** Teachers determined teaching content based on key and difficult points in the syllabus, including concepts and components of nursing critical thinking, concepts and types of clinical nursing decisions, while simultaneously

integrating humanistic care ability cultivation. Teachers prepared courseware and lesson plans and distributed learning materials to students two weeks in advance.

④ **Student Grouping:** Following the principle of heterogeneity within groups and homogeneity between groups, 200 students were divided into 16 groups of 12 (two groups had 16 members). Each group selected an ideologically active, organized student as group leader and appointed a recorder to document group discussions.

⑤ **Student Pre-class Preparation:** Students completed the Caring Ability Inventory to help teachers understand their baseline humanistic care ability. Concurrently, students engaged in pre-class self-study, familiarized themselves with chapter knowledge, and discussed script patient selection.

(2) Classroom Teaching Implementation (160 minutes total)

① **Theoretical Instruction (40 min):** Teachers systematically explained chapter teaching objectives, key and difficult points, and core concepts and frameworks of nursing critical thinking and clinical decision-making using PowerPoint presentations.

② **Scenario Simulation Exercise Phase (40 min):** Experimental group students, building upon pre-class self-study and group discussion outcomes, developed and rehearsed scripts incorporating humanistic care and nurse-patient empathy elements under teacher guidance. Students assigned roles and performed, focusing on experiencing empathic processes and caring behaviors during nurse-patient interactions.

③ **3C Guided Reflection (40 min):** Teachers led structured reflective discussions.

Context Analysis: Instructors guided students to review the entire simulation process through humanistic core questions such as: "What were the patient's core symptoms?" "What patient conditions did you prioritize?" "How did you perceive the patient's emotional state—did you notice any unexpressed needs?" These questions prompted students to reorganize patient physical-psychological needs and humanistic care processes in conjunction with feedback questions, promoting deep integration of humanistic concepts with clinical practice.

Content Exploration: Instructors employed a questioning logic of "I see, I wonder, I feel." For example: "I noticed you communicated with the patient using this expression. I wonder how you considered the patient's emotional state and treatment compliance at that moment?" "Do you think this communication style could make patients feel cared for? Is there room for improvement?" Teachers provided immediate positive guidance based on student responses, helping them enhance clinical decision-making abilities and humanistic care awareness.

Course Reflection: Teachers encouraged students to actively express viewpoints, analyzing their strengths and weaknesses in the simulation from their perspective: "What new understandings of 'humanistic care' has this experience given you?" "How do you plan to apply these insights in future real clinical practice?" Students also engaged in self-reflection or peer evaluation regarding their approaches during the

exercise, further clarifying directions for improvement and strengthening autonomous learning and reflection abilities.

④ **Summary and Survey Phase (40 min):** Teachers summarized core learning points, administered theoretical tests with immediate feedback, and had experimental group students complete Caring Ability Inventory and teaching evaluation questionnaires.

(3) Post-class Consolidation and Extension

Students submitted written reflective journals, and teachers provided targeted personalized written feedback to promote further knowledge internalization.

1.2.3 Evaluation Tools

1.2.3.1 Theoretical Test: The assessment covered important knowledge points from this chapter, consisting of 10 multiple-choice questions with a total score of 100. Tests were administered to both groups after completing the chapter.

1.2.3.2 Caring Ability Inventory (CAI)[9]: Developed by American nursing professor Nkongho and revised by Ma Yulian et al., the CAI has a Cronbach's α coefficient of 0.925, indicating good reliability and validity with widespread application. The inventory contains 37 items across three dimensions: Understanding (14 items), Courage (13 items), and Patience (10 items). Items are rated on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree), with total scores ranging from 37-259. Thirteen items require reverse scoring. Higher total scores indicate stronger humanistic care ability.

1.2.3.3 Teaching Evaluation: Following the educational reform, referencing Ling Tao et al.[10], a self-developed teaching evaluation form using a 5-point Likert scale (1 = strongly agree to 5 = strongly disagree) assessed students' acceptance and evaluation of the teaching model across multiple dimensions. Lower scores indicated more positive teaching evaluations.

1.2.4 Statistical Methods

Data were analyzed using SPSS 29.0 statistical software. Count data were presented as frequencies (n) and percentages (%), with between-group comparisons using the chi-square test. Measurement data were described as mean $\pm$ standard deviation, with between-group comparisons using independent samples t-tests. $\alpha=0.05$ was set as the significance level, with $P<0.05$ indicating statistically significant differences.

1.3 Qualitative Study

1.3.1 Interview Participants

After completing the quantitative study, 40 nursing students were purposively selected from the experimental group using maximum variation sampling strategy. Sampling fully considered factors such as gender, magnitude of change in humanistic care ability from pre- to post-test (high/medium/low), and classroom participation activity to ensure information richness and perspective diversity.

1.3.2 Data Collection

Data were collected using semi-structured in-depth interviews. Interviews were conducted one-on-one in quiet, independent meeting rooms, with an average interview duration of 42 ± 8 minutes. Before interviews, participants were again informed of the study purpose, confidentiality principles, and audio recording arrangements, and signed interview-specific informed consent forms. The interview guide primarily addressed: (1) overall experience with the teaching model and recall of critical incidents; (2) specific impacts of the 3C feedback phase and personal cognitive changes; (3) awareness of changes in personal humanistic care ability and attributions; (4) understanding of connections between theoretical knowledge and practical application; (5) difficulties encountered and specific suggestions for teaching improvement.

1.3.3 Data Analysis

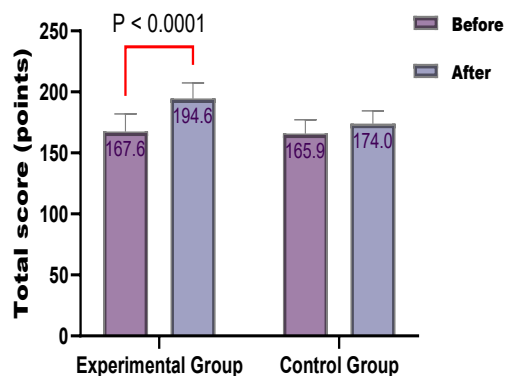
Thematic analysis followed Braun and Clarke's six steps[11]: (1) familiarization with data: repeatedly listening to recordings and reading transcripts; (2) generating initial codes: extracting meaningful units; (3) searching for themes: clustering related codes to form potential themes; (4) reviewing themes: checking theme fit with codes and overall data; (5) defining and naming themes: refining core meanings and appropriately naming themes; (6) producing the report: selecting most representative original statements to present findings clearly and completely. To enhance rigor, two researchers independently coded data, with disagreements resolved through discussion or consultation with a third researcher. NVivo 12.0 software was used for data management.

2. Results

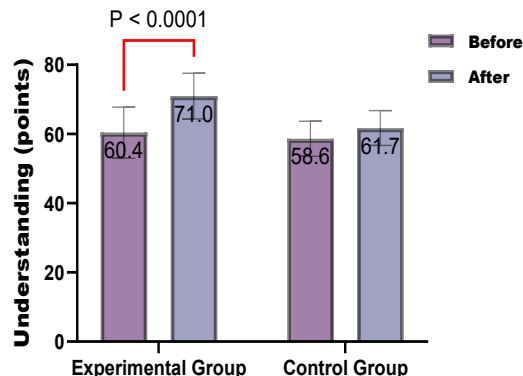
3. 2.1 Quantitative Results

2.1.1 Comparison of humanistic care ability scores of the two groups of nursing students before and after teaching

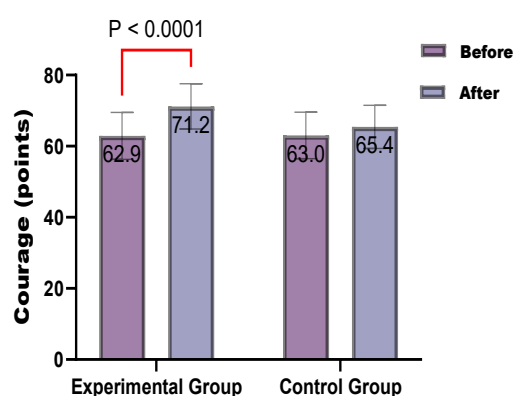
The Caring Ability Inventory was administered before and after the educational intervention. Before the intervention, there were no statistically significant differences in total CAI scores or dimension scores between groups ($P > 0.05$). After the intervention, the experimental group demonstrated significantly higher total CAI scores and scores across all three dimensions (Understanding, Courage, Patience) compared to the control group, with all differences reaching statistical significance ($P < 0.0001$), as shown in Figures 2-5.



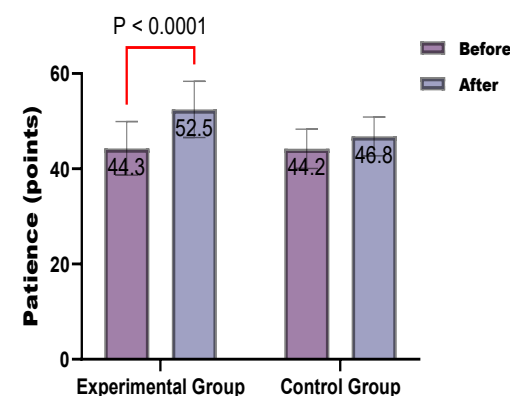
Figures 2 Total score



Figures 3 Understanding

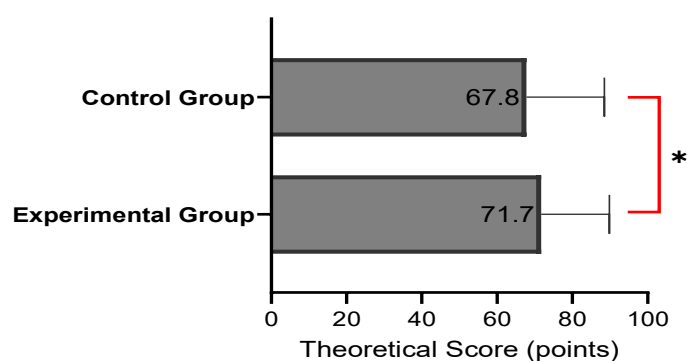


Figures 4 Courage



Figures 5 Patience

2. 1. 2 Comparison of theoretical test scores between two groups of nursing students is shown in Figure 6. The theoretical scores of nursing students in the experimental group were significantly higher than those in the control group ($t=2.315$, $p<0.05$), with the difference being statistically significant.



Figures 6

Note: * (Significant difference) $P<0.05$

2. 1. 3 Nursing students in the experimental group provided overall favorable evaluations of the three-dimensional linkage teaching model, as detailed in Table 7.

Table 7: Evaluation Form of Teaching Effectiveness for Nursing Students in the Experimental Group

satisfaction of teaching	Strongly agree [n (%)]	agree [n (%)]	neutral [n (%)]	disagree [n (%)]	Strongly disagree [n (%)]
Teachers have in-depth research in their professional field	116(58.00)	76(38.00)	7(3.50)	1(0.50)	0(0.00)
The teacher made full preparations before class	121(60.50)	73(36.50)	5(2.50)	1(0.50)	0(0.00)
Teacher guides the student to obtain the teaching resources (library, Internet, etc.)	108(54.00)	85(42.50)	5(2.50)	1(0.50)	1(0.50)
Scenario simulation course structure was reasonable with appropriate pacing	103(51.50)	92(46.00)	4(2.00)	1(0.50)	0(0.00)
Teachers used appropriate methods to stimulate active thinking and learning initiative	103(51.50)	87(43.50)	8(4.00)	2(1.00)	0(0.00)
Improved interpersonal communication skills	104(52.00)	87(43.50)	7(3.50)	1(0.50)	1(0.50)
Improved humanistic care ability	104(52.00)	90(45.00)	6(3.00)	0(0.00)	0(0.00)
Helped improve critical thinking, problem analysis, and problem-solving abilities	100(50.00)	91(45.50)	9(4.50)	0(0.00)	0(0.00)
Promoted theory-practice integration and enhanced understanding/mastery of theoretical knowledge	99(49.50)	93(46.50)	7(3.50)	1(0.50)	0(0.00)
Actively participated in class, observed and simulated patient care	99(45.50)	90(45.00)	9(4.50)	2(1.00)	0(0.00)
Received help/prompts from teachers/classmates when unsure during design process	104(52.00)	85(42.50)	8(4.00)	3(1.50)	0(0.00)
Scenario simulation provided opportunities for teacher-student and student-student communication/discussion	99(45.50)	93(46.50)	7(3.50)	1(0.50)	0(0.00)
Hope this teaching method continues in future courses	106(53.00)	86(43.00)	8(4.00)	0(0.00)	0(0.00)
Overall satisfied with this course content	98(49.00)	90(45.00)	10(5.00)	2(1.00)	0(0.00)

2.2 Qualitative Results

Through in-depth analysis of 40 interview transcripts, four core themes and eight sub-

themes were identified, as shown in Table 8.

Table 8. Thematic Structure of Qualitative Interview Data

core themes	eight sub-themes
Deep Awakening of Empathy—A Journey from Cognition to Embodied Experience	Embodied experience breaking emotional barriers Role reversal bringing perspective transformation
3C Feedback as a Scaffold for Cognitive Reconstruction	Structured questioning guiding deep thinking Peer sharing expanding cognitive boundaries
Courage Cultivation and Behavioral Risk-Taking in a Safe Environment	Low-risk environment lowering barriers to experimentation Positive reinforcement enhancing self-efficacy
From External Requirements to Internal Identification—Professional Internalization of Caring	Redefining the professional meaning of a "good nurse" Caring as professional responsibility rather than an additional task

2.2.1 Theme 1: Deep Awakening of Empathy—A Journey from Cognition to Embodied Experience

Student participants universally reported that scenario simulation created "immersive experiences that no textbook or lecture could provide." Student P05 described: "When I held the 'patient's' slightly trembling hand and spoke comforting words while looking into their eyes, that genuine sense of connection made me instantly understand what 'therapeutic presence' in the textbook truly means." This embodied experience transformed abstract humanistic care concepts into something concrete, perceptible, and actionable. Furthermore, the perspective transformation brought about by role-playing as patients proved particularly crucial. Student P09 shared: "Only when I lay on the hospital bed as a 'patient' did I truly realize how much a nurse's hurried procedure performed without eye contact makes me feel undervalued and overlooked." This profound experience directly corresponded to and explained the significant improvement in CAI's "Understanding" dimension scores.

2.2.2 Theme 2: 3C Feedback as a Scaffold for Cognitive Reconstruction

Students emphasized that 3C guided reflection served as "the critical link transforming chaotic, emotional simulation experiences into clear, rational cognition." Student P14

shared in detail:" During 'Context analysis,' I was merely recounting what happened. But when we entered 'Content exploration' and the teacher asked, 'Why did you choose to explain the procedure steps first rather than comforting the patient's emotions?'—that's when I began to examine the priority order in my clinical decisions." This process perfectly embodied the function of "reflection-on-action" in challenging and reconstructing existing cognitive patterns. Simultaneously, peer sharing during the feedback phase played a vital role. Student P18 remarked:" When classmates reflected back, saying 'I noticed you used empathic responses multiple times when communicating with the family member,' I realized that I could naturally apply these skills in context—this gave me a new appreciation of my communication abilities."

2.2.3 Theme 3: Courage Cultivation and Behavioral Risk-Taking in a Safe Environment

The psychological safety provided by the simulated teaching environment was repeatedly emphasized by students. Student P02 stated:

"In a real ward with real patients and families, I would not dare to try new, unfamiliar communication approaches for fear of making mistakes, being criticized, or causing conflicts. But in this simulated classroom, 'attempting' itself was encouraged and expected."

This sense of security significantly reduced students' emotional barriers to stepping outside their comfort zones. Teachers' immediate, specific positive feedback further reinforced effective caring behaviors. Student P23 recalled:

"After I successfully calmed an 'anxious family member' with a few sentences, the teacher specifically highlighted and affirmed my three-step communication approach: 'naming the emotion—providing limited information—offering appropriate hope.' This convinced me that the method was useful and that I could apply it again in real clinical scenarios."

2.2.4 Theme 4: From External Requirements to Internal Identification—Professional Internalization of Caring

The most profound changes occurred at the level of students' understanding of the nursing profession's essence and their professional identity formation. Multiple

students described reconceptualizing "what nursing truly means." Student P30 reflected: "I previously, perhaps subconsciously, believed that nursing was simply about accurately executing physicians' orders and proficiently completing technical procedures. But now I recognize that technical interventions devoid of humanistic care constitute incomplete—even potentially deficient—nursing practice."

This cognitive shift signified the beginning of humanistic care's transition from an external course requirement or professional norm toward internalization as a core professional value. Student P38's summary was particularly representative:

"I no longer 'perform' caring merely to complete classroom tasks or fulfill assignment requirements. I have begun to genuinely identify with the belief that caring about patients' suffering, respecting their wishes, and protecting their dignity—this is fundamentally what I should embody as a future nurse."

3. Discussion

3.1 The Experience-Reflection Cycle: Core Mechanism for Enhancing Humanistic Care Ability

Humanistic care in clinical nursing is primarily manifested through concern for patients' health, needs, rights, and dignity, reflecting a fundamental attitude toward life[12]. Integrating humanistic care concepts into nursing practice has become an inevitable trend in the development of modern nursing, as cultivating this spirit among nurses is essential for advancing the profession[13]. As shown in Figures 2–5, following the educational intervention, the experimental group demonstrated significantly higher total scores on the Caring Ability Inventory, as well as scores across all three dimensions (Understanding, Courage, and Patience), compared to the control group ($P < 0.0001$). This reveals that the teaching model enhances students' humanistic care ability by constructing a complete "experience-reflection" learning cycle.

First, the highly simulated clinical scenarios created through scenario simulation generated strong emotional responses in students—empathy when facing patient suffering, anxiety when handling emergencies, and a sense of achievement after

successful communication—which served as catalysts triggering deep reflection and provided embodied experiences for reflective learning. This aligns closely with the "concrete experience" phase emphasized in Kolb's experiential learning theory[14, 15]. The "embodied experiences" and "perspective transformation" revealed in qualitative Theme 1 represent typical manifestations of learning at this stage.

Second, 3C guided reflection provides a systematic, structured framework for the reflective process. Schön distinguished between "reflection-in-action" (occurring during the simulation process) and the more significant "reflection-on-action" [7]. In this study, the 3C feedback session specifically created a safe psychological space for "reflection-on-action" and guided students through a progressively deepening chain of questions: from objectively describing facts (Context analysis), to in-depth analysis of the decision-making logic and value judgments underlying behaviors (Content exploration), to abstracting general principles and planning future actions (Course reflection). This enabled students to transform emotional, chaotic experiences into clear, transferable practical cognition. Qualitative Theme 2 indicates that this process perfectly embodied the function of "reflection-on-action" in challenging and reconstructing existing cognitive patterns. Students experienced a cognitive leap from "only knowing what happened" to "understanding why it happened" to "clarifying how to improve." This structured guidance process effectively prevented reflection from remaining spontaneous, casual, or superficial, ensuring depth and directionality of the reflective process.

Ultimately, this complete cycle facilitated the generation of "practical knowledge"—a composite form of knowledge integrating disciplinary theoretical knowledge, personal experiential insights, and contextual wisdom, Kane[16] conceptualized this process as "making sense of praxis" in their latest study. It refers to the transformation of abstract theories into transferable professional knowledge by nursing students through experience, personalized understanding and repeated practice in clinical situations. Students no longer merely memorized abstract principles such as "humanistic care should be demonstrated" but developed personalized, contextualized knowledge such as "in this specific clinical situation, through specific verbal and non-verbal behaviors,

I can effectively convey caring and comfort patients." This also cognitively explains why the experimental group performed better on theoretical examinations: their knowledge was actively constructed through personal experience and deep reflection rather than passively received, resulting in deeper understanding, more solid memory retention, and more flexible application.

3.2 Psychological Safety: A Prerequisite for Courage Cultivation and Behavioral Experimentation

The significant improvement in the "Courage" dimension of the Caring Ability Inventory was convincingly interpreted and supported by qualitative Theme 3. This study found that the creation of a psychologically safe environment was a key contextual factor enabling the successful implementation of the integrated teaching model. Edmondson defined team psychological safety as a shared belief that team members can take interpersonal risks—such as asking questions, admitting mistakes, or trying new approaches—without fear of negative consequences[17]. In the simulated scenarios of this study, students clearly understood that their "clinical errors" would not cause real harm and that any attempted behaviors would receive constructive guidance rather than simple criticism. This significantly reduced the emotional barriers and risk perception associated with unfamiliar caring behaviors, making students willing and confident to practice communication and caring skills that they might avoid in real clinical environments due to fear of failure or criticism.

Notably, the specific manner in which teachers provided feedback proved critical. Qualitative data revealed that teachers predominantly adopted a feedback model characterized by “affirming specific behaviors while offering suggestions for improvement.” This form of formative feedback not only protects students’ self-esteem and the self-confidence they have initially developed, but also clearly delineates the specific direction for subsequent learning and growth. A substantial body of educational research indicates that this type of supportive, development-oriented feedback is a core element in cultivating students’ self-efficacy and promoting their sustained competency development. Similarly, Arrogante noted that supportive educator behaviors—such as

mentoring, emotional support, and professional role modeling—are significantly associated with students' self-confidence, emotional regulation, and adaptability[18]. Furthermore, the Feedback Quality Instrument developed by Johnson et al. explicitly identifies “fostering learner agency” and “fostering psychological safety” as core dimensions of high-quality feedback[19]. This aligns closely with the “affirmation + suggestion” feedback model employed in this study—which, by creating a psychologically safe environment, empowers learners to autonomously chart their own paths for improvement, thereby fostering the sustained enhancement of self-efficacy.

3.3 Reflection-Driven Cognitive Deepening: Mechanisms Underlying Theoretical Performance Improvement

Introduction to Nursing serves as a bridge between foundational medical courses and professional nursing curricula, representing the "first course" through which students enter the nursing profession. It plays a crucial "guide" role in cultivating students' professional competence and professional values[20]. However, this course has traditionally been dominated by teacher-centered instructional approaches. Due to its relatively abstract content, it struggles to evoke emotional resonance among students, which undermines the value-guiding function of ideological and political education[21]. This study demonstrated that the experimental group's theoretical test scores were significantly higher than those of the control group ($P < 0.05$), indicating that deep reflection not only promotes emotional and attitudinal change but also effectively enhances cognitive learning outcomes.

From a cognitive constructivist perspective, the experimental group's significantly improved theoretical scores indicate that deep reflection effectively promotes the integration and mastery of theoretical knowledge.

Prior to class, teachers designed preparatory tasks based on actual clinical needs for disease treatment and nursing care, guiding students to independently access learning materials through multiple channels. Embedded within this process was "patient-centered" professional value guidance, enabling students to focus not only on knowledge acquisition during preparation but also to contemplate "how to alleviate patient suffering through professional knowledge." This approach effectively

stimulated students' intrinsic motivation for active learning[22]. This preparatory design, anchoring theoretical content to clinical problems, laid the cognitive foundation for subsequent deep reflection.

During class, the instructional design focused on typical scenarios involving sudden changes in patient conditions, fully implementing the teaching philosophy of "student-centered, teacher-guided" learning. This approach shifted students from passively receiving knowledge to actively solving clinical problems. During interactive feedback sessions, teachers engaged students in discussions around issues such as "how nursing procedures can balance technical proficiency with humanistic care" and "how to communicate with and comfort patients when addressing their concerns." These discussions facilitated collaborative exploration of knowledge points and organization of nursing thought processes. Simultaneously, nurse-patient empathy elements were incorporated to guide students in transforming theoretical knowledge into compassionate nursing competence. During the "Course reflection" phase of 3C feedback, students were required to connect specific decisions made during simulations with abstract concepts from Introduction to Nursing (such as critical thinking and clinical decision-making types). This reflective process, anchoring theoretical concepts to vivid experiential learning, greatly enhanced knowledge's personal relevance and depth of memory, transcending traditional rote memorization to achieve higher-level meaning construction[23, 24].

Post-class debriefing further consolidated and internalized professional knowledge and humanistic values. This reflective practice not only provided evidence for students to adjust their learning methods and develop personalized learning plans [25]but also laid a solid cognitive foundation for their future development as nursing professionals equipped with both technical competence and humanistic sensibility.

3.4 Learner Perspective Validation: High Acceptance of the Teaching Model

Scenario simulation offers extensive educational benefits and is increasingly being integrated into nursing education as a key instructional strategy, providing students with experiential learning opportunities that help them connect theoretical knowledge with

professional practice[26, 27]. Results from this study showed that 96% of students agreed that the 3C guided reflection combined with scenario simulation teaching model could guide students in applying theoretical knowledge to complex clinical practice situations and enhance their understanding and mastery of theoretical knowledge.

From the perspective of learning agency, this teaching model adopted a small-group format in which students selected diseases of interest, collaboratively consulted materials to develop scripts, and completed rehearsals. Throughout the process, students took the lead, fully mobilizing their initiative and cultivating autonomous learning abilities[28]. By role-playing as nurses, doctors, patients, and family members, 95% of students actively participated in class, observed and simulated patient care, increased opportunities for teacher-student and student-student communication and discussion, exercised their language communication and clinical practice abilities, and enhanced team collaboration skill[29].

During the 3C guided reflection phase, teachers helped students analyze patient conditions and treatment approaches, organize disease knowledge frameworks, guide students to attend to patients' physical and psychological needs, and help students gradually develop thinking that values both technical skills and humanistic care. This contributed to improving students' analytical abilities and empathy. Consequently, 95.5%-97% of students reported that when analyzing and solving problems, they actively considered patients' humanistic needs, with humanistic care ability and critical thinking developing synergistically.

Teachers used the 3C guided model to reconstruct cases: on one hand, they deconstructed the alignment logic between patient conditions and nursing measures from a clinical thinking perspective, presenting core conceptual frameworks; on the other hand, they provided precise feedback on student performance during exercises, highlighting strengths and weaknesses, while using heuristic guidance to help students identify problems. Through teacher-student collaborative discussion of solutions, students deepened their understanding of clinical nursing. By recreating complex clinical scenarios through simulation, students in immersive experiences transformed caring for patients from a passive requirement into an active, internalized disposition.

Ninety-four percent of students endorsed the model, believing it not only laid a solid foundation for adapting to clinical work but also effectively enhanced their practical ability to safeguard health through humanistic care. Findings from qualitative Theme 4 further confirmed this transformation—students began redefining the professional meaning of a "good nurse," viewing caring as a professional responsibility rather than an additional task. This identity shift from "learner" to "practitioner" represents the most powerful evidence of the deepening effectiveness of this teaching approach.

4. Limitations and future directions

4.1 Limitations

First, this study was conducted at a single medical university, and the teaching effectiveness may be influenced by the interactive effects of contextual factors specific to this institution, including its particular teaching culture, faculty expertise, and student characteristics. Therefore, the generalizability of the conclusions requires caution. Second, this study primarily assessed the immediate effects following the teaching intervention, lacking longitudinal follow-up on the long-term maintenance of students' humanistic care ability. Additionally, it did not examine the transferability of this ability to authentic, complex clinical work environments.

Furthermore, all participants were first-year nursing students whose professional cognition and identity were still in the preliminary formation and exploratory stages. This teaching model may produce different effects on senior students who have already acquired some clinical internship experience.

4.2 Implications for Future Research and Practice

4.2.1 Conduct Multi-Center Studies

Future research should conduct multi-center randomized controlled trials across different regions and types of nursing institutions to validate the universality and applicability of this teaching model across diverse institutional and cultural contexts.

4.2.2 Design Longitudinal Tracking Studies

Longitudinal study designs should be developed to track the dynamic trajectory of

students' humanistic care ability and its influencing factors—from course learning through clinical internships and into professional practice.

4.2.3 Explore Technology-Enhanced Pathways

Active exploration should be undertaken regarding strategies for deepening reflection supported by educational technology. Examples include using electronic reflective portfolios to promote continuous reflection, or combining virtual reality simulation technology with AI-driven immediate feedback systems to provide more immersive and personalized learning and reflection experiences.

4.2.4 Construct Systematic Cultivation Pathways

The reflective practice teaching framework and 3C feedback tool should be organically extended to other core courses in the nursing professional curriculum (such as Medical Nursing, Surgical Nursing, etc.), thereby constructing a systematic humanistic care ability cultivation pathway that runs throughout the entire undergraduate education continuum.

5. Conclusion

Based on reflective practice theory, this study constructed and empirically tested an integrated teaching model combining 3C guided reflection with scenario simulation. The mixed methods results indicate that this model, through creating safe clinical experiential contexts and providing a structured 3C reflective guidance framework, effectively facilitates students' completion of the complete learning cycle from concrete experience to abstract conceptualization. It not only significantly enhanced students' humanistic care ability levels and theoretical knowledge mastery (quantitative evidence) but also more profoundly triggered the awakening of their empathic capacity, reconstruction of clinical cognitive patterns, cultivation of practical courage, and positive transformation of professional identity (qualitative evidence), achieving a three-stage progression in nursing humanistic care education (experience-reflection-internalization). This teaching model provides a theoretically grounded and practically feasible approach for nursing humanities education, contributing to the cultivation of

reflective nursing practitioners who possess both solid professional skills and profound humanistic spirit. It warrants further promotion, application, and continuous optimization in undergraduate nursing education.

6.Data Sharing Statement

The datasets generated and analyzed during the current study are not publicly available due to privacy concerns regarding participant confidentiality. An anonymized dataset may be available from the corresponding author upon reasonable request, subject to institutional ethics approval.

7.Author contributions

Hui Zeng and Changxiu Li: Methodology, Project administration, Funding acquisition. Lina Ma and Jimei Luo: Conceptualization, Formal analysis, Original draft preparation, Review and Editing. Qiuhan Hu and Lulu Huang: Visualization, Data curation. Yan Wang, Qian Su, Luwen Luo, Rong Liu, Hongmin Ran and Yue Chen: Investigation, Statistical data calculation. All authors have participated in the discussion and reviewed the final manuscript.

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9.Conflict of Interest

The authors declare no conflicts of interest.

10.Ethical Review

This study has been approved by the Ethics Committee of the Second Affiliated Hospital of Zunyi Medical University (Approval No. : KYLL-2024-067). All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. All participants signed a written informed consent form before the study and were informed that they had the right to withdraw from the study at any time without any adverse effects. All data were used for research purposes only.

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