Think-aloud approach combined with case-based learning in nursing teaching round for new nurses in cancer hospital

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Abstract

Background The transition from nursing students to working as new nurses can be a challenging process. This study aimed to assess the efficacy of a pedagogical approach amalgamating the think-aloud approach and case-based learning in the instructional rounds for new nurses.

Methods Utilizing convenience sampling, new nurses were selected between 2020 and 2021 in China cancer hospital. A total of 98 participants agreed to participate, with 50 enrolled in 2020 as the control group and 48 in 2021 as the observation group. Across a span of weeks 1, 3, 5, 7, 9, and 11, each clinical department conducted six teaching rounds. The observation group engaged in teaching rounds combining the think-aloud approach with case-based learning, whereas the control group solely utilized case-based learning. Disparities in case analysis scores and critical thinking ability between the two groups were scrutinized, alongside an analysis of learning strategies and the observation group feedback.

Results The observation group exhibited superior case analysis scores (91.92 ± 6.33) and overall critical thinking ability scores (308.39 ± 35.88) in comparison to the control group, which scored (85.27 ± 5.39) and (275.11 ± 31.32) respectively, reflecting statistically significant variances ($t = 1.868 \sim 6.361$, $P < 0.05$). Predominant learning strategies employed in the observation group ranged from cognitive to meta-cognitive, followed by psychosocial strategies. During interviews focused on nurses' feedback on the learning process, themes emerged surrounding the enhancement of learning proficiency, invigoration of learning enthusiasm, and bolstering psychological well-being.

Conclusion The combination of think-aloud approach and case-based learning in nursing teaching rounds greatly improves the efficiency of training and the critical thinking acuity of new nurses. Concurrently, it facilitated an evaluation of learning strategies, thereby offering valuable insights for the nursing teaching rounds of new nurse.

Keywords Think-aloud approach, Case-based learning, New nurses, Nursing teaching rounds, Nursing education, Teaching methods, Critical thinking

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Background

By the year 2020, China boasted a staggering registration of approximately 4.45 million nurses [1], a figure that has sparked projections suggesting a necessity for 8.18 nurses per 1,000 individuals by the year 2030 [2]. This surge indicates a forthcoming influx of new nurses into clinical settings. New nurses training is an essential component of hospital nurse training programs, aiding new nurses in addressing challenges during the transition from nursing students to clinical nurse roles [3]. China's National Health and Wellness Commission has issued the Training Syllabus for Newly Entered Nurses as a guiding document for in-service education. However, there is currently no unified training system or standard. The training content of most hospitals includes theoretical training and skill training, and there exists a single training method, which cannot motivate the enthusiasm of nurses for training, and the training effect is not satisfactory [4]. Notably, the incidence of adverse nursing events among those with less than two years of experience stands at 61.4% [5, 6].

Teaching rounds stand out as a cornerstone for fostering nursing practical education, was deemed one of the most efficacious methods for both learning and instructing in the nursing domain [7]. Serving as a vital component of nurses' clinical practice, these rounds offer a platform to seamlessly blend theoretical knowledge with hands-on practice, thereby nurturing the quality of nursing care and refining interpersonal competencies among trainees [8].Ward rounds, intricate and multifaceted processes, demands a fusion of medical expertise and non-technical proficiency [9]. Medical education has leveraged ward-round teaching to augment students' prowess in patient assessment, management, and nontechnical skills [10]. In nursing practice education, teaching ward rounds play an important role in elevating the standards of nursing students and practitioners, ultimately upholding the quality of nursing services [11].

Case-based learning (CBL), the most common method of ward rounds during ward rotations, is a student-centered, case-based approach to teaching [12]. Medical knowledge is applied to clinical cases, allowing students to apply clinical reasoning and decision-making at all stages of the clinical case management process [13]. However, some studies have found that students' participation is uneven during CBL implementation, which is not conducive to their knowledge acquisition and clinical reasoning ability [14]. Therefore, clinical instructors should actively improve their teaching methods to enhance the effectiveness of training.

Think-aloud (TA) approach as a teaching method suitable for individuals and groups, also recognized as the "oral report method" or "thinking aloud," entails articulating thought processes verbally [15], which finds utility among educators in medical and nursing training settings to enhance students' knowledge acquisition and clinical reasoning ability [16]. Applying the TA approach to the "Geriatric Nursing" case discussion class for undergraduate nursing students has demonstrated significant improvements in training performance, clinical reasoning, and critical thinking skills [17]. By verbalizing and elucidating their thoughts, students can discern and structure pertinent information, thereby making decisions geared towards resolving clinical dilemmas [18]. As an effective teaching approach, TA posits that cognition operates like an ancient city of information processing, where language serves as a window into the cognitive process. By verbalizing their thoughts, students continuously process and refine their thinking independently, thereby enhancing their clinical reasoning and critical thinking skills. This approach not only fosters independent thinking but also enhances students' active participation and engagement.

Cancer as one of the most traumatic diseases, imposes significant physical, psychological, and social burdens on patients throughout the treatment process [19].

Nurse as the primary caregivers of cancer patients, assume multiple roles including assessment, decision-making, treatment, care, and education throughout the diagnostic and treatment process. This multifaceted responsibility implies higher requirements for the clinical practice skills of nurses in oncology hospitals.However, the application of TA approach combined with CBL in nursing teaching rounds for new nurses has not been thoroughly explored.

Therefore, this study incorporates these two methods into the nursing training program for new nurses in oncology hospitals, aiming to assess the efficacy of a pedagogical approach amalgamating the TA approach and CBL in the instructional rounds for new nurses. This integration of pedagogical methods is intended to elevate the clinical practice competencies of new nurses and to address critical challenges in key areas of nursing education and training.

Methods

Participants

Convenience sampling was used to select new nurses from Henan Cancer Hospital between 2020 and 2021. As a 3 A specialized cancer institution, Henan Cancer Hospital not only boasts a national key specialty nursing status but also serves as a pivotal educational hub for national nursing science, accommodating over 3,000 beds and employing nearly 1,800 skilled nurses. The study included new nurses and those with less than two months of experience in clinical nursing roles. Participants who resigned or were absent from their positions for over a month during the study period were excluded. Ethical guidelines were strictly adhered to, with all

participants providing informed consent subsequent to a comprehensive elucidation of the study's objectives and design, facilitated by ethics approval number 2020-KY-0092. The participants were classified into observation and control group based on their year of employment, with the control group comprising 50 nurses recruited in 2020 and the observation group consisting of 48 nurses enrolled in 2021. As per the training schedule for new nurses, six departments were designated for the teaching rounds: neck and thyroid surgery, bone and soft tissue surgery, thoracic surgery, general surgery, breast surgery, and hepatobiliary surgery.

Training design
Aligned with the training program for new nurses, both groups curated typical cases within their respective rotating specialties for the teaching rounds, with a specific focus on head-neck and thyroid surgeries, exemplifying diseases like thyroid tumours, laryngeal tumours, oral and maxillofacial tumours for head-neck thyroid surgery, and oesophageal and lung cancers for thoracic surgery. Commencing in the second month following the nurses' induction, each rotation department organized six nursing teaching rounds in weeks 1, 3, 5, 7, 9, and 11.

Control group
This group embraced the CBL
First, pre-teaching preparation encompassed enlightening the nurses in the control group about the definition, utility, and nuances of the case teaching method. Clinical nursing instructors handpicked illustrative cases tailored to the diseases prevalent in the specialized rotations, demystified the purpose and methodologies employed during rounds to new nurses, and elucidated clinical intricacies in tandem with case data.

Second, during teaching rounds, lasting 60–70 min, the patient's primary concerns were documented within the wards, followed by a comprehensive physical assessment. Subsequent deliberations ensued within office settings, deliberating on the chief clinical complaints, physical findings, and diagnostic outcomes, culminating in nurse evaluations, tailored diagnoses, the formulation of precise nursing strategies, and the articulation of nursing objectives. The session concluded with the new nurses presenting their findings to the group.

Finally, post-teaching round summaries lasted 5–10 min, wherein clinical teaching personnel encapsulated key revelations, navigated challenges encountered, dissected pinpointed issues, and proposed enhancements.

Observation group
This group combined TA approach and CBL.The observation group differed from the control group in several key aspects. It was based on the observation group using CBL with the addition of the TA approach. The TA approach includes theoretical knowledge training, "three step" thinking path training, and think-aloud method case reporting, which are steps not included in the control group.

First, establishment of a teaching round research group comprising 11 members, spearheaded by the deputy director of the nursing department overseeing nursing instruction, six nursing teaching leaders, and four clinical nursing educators—all holding supervisory nurse titles or higher with over 5 years of oncology specialty teaching experience. The research team leader, deputizing the nursing department, was entrusted with formulating the intervention plan, ensuring quality control, and supervising implementation.

Second, based on the initial draft of the intervention design developed from the literature review, the intervention was refined through consultations with experts in nursing, education, and psychology. culminating in a pilot trial encompassing three new nurses to streamline operational details like seating arrangements during bedside rounds and optimal positioning of video equipment during presentations, eventually leading to the finalization of a comprehensive intervention scheme for nursing rounds incorporating the TA approach.

Third, theoretical knowledge training and"three step" thinking path training were conducted for new nurses. The theoretical knowledge training totaled 3 times. The "three step" thinking path training was initially modeled by the trainers using case studies, followed by the students presenting and reporting the process, with trainers providing face-to-face guidance.

Finally, typical cases were selected, and the new nurses were informed in advance to prepare their knowledge related to these cases. The personnel were then organized into small groups. This was followed by bedside rounds, case reports using TA approach, and discussions and summaries after the nursing rounds. The detailed procedures and case presentations for the educational observation group are provided in Table 1.

Indicators
Basic demographic and baseline information of the new nurses, including gender, age, education level, case analysis scores, and critical thinking ability scores, were collected one week prior to the commencement of the nursing teaching rounds. To evaluate the effectiveness of the nursing teaching rounds, both groups of nurses were assessed for case analysis scores and critical thinking ability scores one week post-training. Additionally, to assess the learning strategies of the new nurses, the observation group provided feedback and evaluated the

Table 1 Think-aloud (TA)approach combined with case-based learning scheme

Step	theme	Specific content	Example display
Prepa-ration before ward rounds	training	The training includes theory sessions and three-step thinking path training. (1)theory sessions: a total of 3 times, each lasting 45 min.①The first training content included the definition, application, and development status of the TA approach. ②The second training content included the use of the TA approach, precautions and psychological quality preparation of the nurses (overcoming timidity and self-confidence, worry about deficiencies in personal "learning skills", and fear of video recording). ③The third training content included the definition, usage, and matters needing attention in the case-based learning method. All three training sessions were completed by one member of the research team. (2)Three-step thinking path training: ①The initial phase entailed identifying the issue at hand and determining the necessary data collection methods to address it, as well as strategies for summarizing and organizing the information to facilitate a deeper comprehension. ②Subsequently, participants were tasked with integrating case scenario data with existing resources to offer reflections on the theme and suggest additional insights. ③In the final stage, participants were required to assess the adequacy of the existing information and propose supplementary details if deemed necessary. The instructor first demonstrated the three-step thinking path with cases, and then provided clinical cases with relevant information of hospitalised patients in the same period. Five patients had laryngeal cancer, lung cancer, rectal cancer, breast cancer, and liver cancer, respectively. New nurses conducted simulation exercises with case data, and the instructor then provided targeted guidance according to the reports. Each person trained for ≥ 3 times, and each training lasted for 15 ~ 30 min.This link was completed by one member of the research team.	**"three step" thinking path training** (Laryngeal cancer with complications of pha-ryngeal leakage) **Step1**: When presented with a patient exhibiting signs of throat leakage, it is imperative for the participant to consider potential underlying issues, identify relevant symptoms, signs, and diagnostic criteria, and determine appropriate diagnostic procedures and physical examinations.
	Selected appropriate cases	①six typical cases of common diseases in rotation departments were selected for the teaching rounds. Cases involving repetitive thinking training were avoided in case selection, but cases with the same diseases and different treatment methods and conditions could be selected. ②The nurses were informed of patient information, teaching objectives, and teaching purposes three days in advance after case selection, so as to leave time for the new nurses to study and consult relevant materials.	**Step2**: In the case of a patient displaying exudation around a tracheotomy site, accompanied by localized skin redness and pain, indicative of possible pharyngeal leakage, further assessment through a drinking water test and color Doppler ultrasound examination is warranted for accurate diagnosis.
	Personnel grouping	Each group included three roles: case reporters using TA, language prompters, and data recorders, while three people in each group took turns to ensure everyone was participating in reporting.	
Implement teaching ward rounds	Bedside rounds	Each participant was first expected to check the patient, which took 10 ~ 20 min, while the teaching teacher led the new nurse through the process of checking the patient at the bedside, asking about the chief complaints and related feelings, and taking vital sign measurement and conducting a physical examination.	**Step3**: The patient presented with symptoms indicative of pharyngeal leakage, which were corroborated through the utilization of color Doppler ultrasound and a water swallowing test. Additionally, blood tests were conducted to confirm whether the patient had an infection, and to provide a basis for future nursing measures
	Report-ing and recording	TA was used to report what was happening, which took 20 ~ 30 min, under the guidance and supervision of the teacher throughout. The reporting location was the office, and the entire process was recorded among the groups. When reporting cases, clinical problems were taken as a guide; nursing evaluation was carried out around clinical manifestations, physical examination, inspection, and inspection indicators; nursing diagnosis was defined; personalised nursing measures were formulated; and dynamic evaluation was given effect. Each reporter expressed their thinking process aloud. However, it should be noted that when a reporter paused for more than 30 s, a language prompter would use prompts such as "Go ahead", "Please express your thoughts verbally", "What else have you thought of", or "What else".	
	Discussion	10 min were taken to discuss each case collectively and to put opinions and suggestions forward on the rounds.	
	Summary after ward rounds	Took 5–10 min, and the teacher commented on it, summarised the key points and difficulties of the round, and highlighted any shortcomings and suggestions for improvement.	

learning strategies of the new nurses following the nursing teaching rounds.

Scores of case analysis
Assessment outcomes of case analysis were meticulously orchestrated by the team, incorporating a structured case analysis assessment test featuring aptly challenging cases mirroring the rotation specialties, distinctly apart from those explored in nursing teaching rounds. Conducted in a closed-book format, the assessment necessitated nurses to address key components—nursing assessment, diagnosis, plan, implementation, and evaluation—based on

case particulars. Each facet carried a weight of 20 points, accumulating to a maximum score of 100 points. The Scale-level Content Validity Index (S-CVI/AVe) of the paper was 0.804. Pre-and post-nursing teaching round case analyses were independently evaluated, supervised by educational leaders within each subspecialty. An impartial, non-research team instructor evaluated responses in congruence with confirmed solutions.

Critical thinking ability

Evaluation of critical thinking abilities bore precedence prior to and after the teaching rounds, leveraging the Chinese version of the Critical Thinking Ability Scale revised by Peng in 2004 [20]. This evaluation encompassed seven dimensions—truth-seeking, open-mindedness, analytical prowess, systematic thinking, self-assurance, curiosity, and cognitive maturation—featuring 70 items. Employing a 6-point Likert scale, scores spanned from 70 to 420, with responses gauging levels of agreement ranging from "strongly agree" to "strongly disagree," whereby negative items commanded scores from 1 to 6, and positive items from 6 to 1. The scale demarcated negative, indeterminate, positive, and robust critical thinking tendencies based on total score brackets [21]. Noteworthy reliability encountered through Cronbach's α coefficient was 0.802, with dimensions fluctuating within the range of 0.653 to 0.865.

Learning strategy

The analysis of learning strategies includes four steps: transcription of video materials, evaluation of data reliability and validity, inclusion of qualified data, and classification and frequency statistics of strategies. In this study, the above steps were meticulously reviewed, evaluated, and statistically analyzed by two clinical teachers to ensure the accuracy of the results.Subsequent analysis by the research team delved into the application of learning strategies, categorizing them into meta-cognitive, cognitive, and social-emotional paradigmss [22]. The strategy distribution encapsulated the strategic landscape exhibited in specific cognitive behaviors, encompassing the types and utilization frequencies of distinct strategiess [23]. The assessment of the reliability and validity of learning strategy data utilized a logical rather than a statistical approach, including 11 evaluation criteria [18]. Reliability indicators included ensuring that the data were not collected under inspiration or guidance and that the data were not fabricated by the subjects to suit or cope with the tester. Validity checks included the tester's experience with audible thought data collection, the representativeness of the selected sample, technical and psychological training for subjects, a suitable testing environment, clear and reliable video quality, cumulative silence in videotaped material not exceeding 10%

of the total test time, and strict adherence to transcription norms. Shared indicators for reliability and validity included data from subjects with good cooperative attitudes and no unforeseen conditions (e.g., psychological or health issues) affecting subjects and testers before and during the test. The reliability and validity analysis of the strategic data in this study was completed by two researchers over two rounds: initially, each researcher assessed separately, followed by a joint assessment, and data were included in the analysis only after reaching mutual agreement.

Learning feedback

Elicitation of learning feedback within the observation group transpired through individual interviews, soliciting new nurses' perspectives and suggestions concerning the teaching rounds model. The interview framework was informed by existing literature and insights from nursing education experts [24, 25], refined through a preliminary trial involving two participant nurses. The guide encompassed nuanced queries probing the novices' sentiments post-teaching experience, their perceived learning gains, recommendations for enhancing teaching rounds, and a reflective assessment of encountered challenges and resolution pathways. Each interview spanned 15–20 min and participants were transparently briefed that recordings would be preserved anonymously, with a mandate allowing them to cease participation at their discretion. The overarching goal and logistics of the interview were communicated before initiation, with the qualitative sample size dictated by data saturation. Iterative queries post-interview were posed to elicit comprehensive feedback, the cease of interviews transpired upon attaining saturation, with transcripts transcribed into textual data. Noteworthy, feedback themes from nursing rounds underwent analysis encompassing the Colaizzi method underpinned by thematic analysis framework.

Statistical analyses

Data input was meticulously cataloged using an Excel spreadsheet, subjected to dual verification to guarantee precision, with analyses conducted through SPSS 21.0 software. Descriptive statistics incorporating mean and standard deviation statistics encapsulated age, case analysis scores, and critical thinking ability scores, whereas gender, educational background, sole child status, and learning strategies were articulated through frequency and percentage statistics. Age, case analysis scores, and critical thinking ability scores among nurses in the two groups underwent comparison via T-tests, whereas educational background, sole-child status, and gender patterns were scrutinized through χ^2 tests. Statistical significance was stipulated at $P < 0.05$.

Table 2 Basic characteristics of new nurses(baseline data)

		Control group (n = 50)	Observation group (n = 48)	t/x^2	P
Age		23.46±1.33	23.73±1.29	1.020	0.310
Gender	Male	5	6	0.154	0.695
	Female	45	42		
Education	Undergraduate	41	37	0.364	0.546
	graduate	9	11		
The One-child	Yes	22	23	0.151	0.697
	No	28	25		
Scores of case analyse $(\overline{X}\pm S)$		83.15±3.76	84.24±3.95	1.398	0.165
Critical thinking ability $(\overline{X}\pm S)$		259.43±26.39	265.47±27.54	1.108	0.271

Chi-square test was used to compare gender, education level and the one-child; Scores of case analysis and critical thinking abilities were compared using the T-test

Table 3 Critical thinking ability of new nurses after ward round

	Control group (n = 50)	Observation group (n = 48)	t	P
Seek truth	42.33±3.8	48.57±5.68	6.361	<0.001**
Open mind	41.42±4.37	47.25±5.15	6.031	<0.001**
Analytic ability	35.74±5.12	40.23±5.39	4.225	<0.001**
Systematize ability	37.52±4.26	40.03±5.01	2.667	0.009**
Confidence	41.35±5.14	47.71±5.923	5.669	<0.001**
Curiosity	44.31±4.71	49.51±5.63	4.949	<0.001**
Cognitive maturity	47.31±4.83	49.17±5.02	1.868	0.065
Total score	289.98.±32.21	322.47±37.78	4.573	<0.001**

** Correlation is significant at the 0.01 level (2-tailed)

Table 4 Application of learning strategies

Learning strategies	Frequency (n)	Percentage(%)
metacognitive strategy	604	27.95
Prepare in advance	110	18.21
Planning	133	22.02
Self - monitoring	34	5.63
Self-assessment	56	9.27
Concentration	157	25.99
Find the problem	66	10.93
Sidestep	48	7.95
Cognitive strategy	1164	53.86
Repeat	372	31.96
Check and testify	140	12.03
Association	110	9.45
Conjecture	103	8.85
Interpretation	79	6.79
logical inference	211	18.13
Summary	149	12.8
Social/emotional strategies	393	18.19
Consultation	197	50.13
Self-encouragement	68	17.30
Hesitation	96	24.43
Disappointment	32	8.14

Results

Baseline data
The mean ages of the nurses in the control and observation group were 23.46±1.33 and 23.73±1.29, respectively. The mean case analysis results for the control and observation group were 83.15±3.76 and 84.24±3.95, respectively. Notably, there were no statistically significant disparities in baseline data between the two cohorts of new nurses, as delineated in Table 2.

Scores of case analysis
The mean case analysis scores of new nurses in the control group (90.33±6.17) lagged behind those in the observation group (95.49±6.62), with a statistically significant difference observed (t=3.988, P<0.001).

Critical thinking ability
Subsequent to the teaching rounds, discernible discrepancies in critical thinking prowess emerged between the observation and control groups, save for the cognitive maturity dimension, where distinctions were statistically significant (P<0.05), depicted in Table 3.

Learning strategies analysis
A corpus of 98 videos was amassed for meticulous scrutiny. Post-examination for reliability and validity, 90 written transcriptions met the stringent inclusion criteria, while eight entries were extirpated; three owing to prolonged periods of reporter silence exceeding 10% of the total video duration, and five due to noncompliant transcription standards. These revelations are detailed in Table 4.

Feedback of the new nurses on the nursing rounds using TA approach
A dozen nurses underwent individual interviews, eliciting feedback spanning diverse themes inclusive of honing independent cogitation and swift responsiveness, refining verbal dexterity and logical ratiocination, stimulating a vested interest in learning among peers, instilling personal confidence, nurturing proactive learning propositions, pre-round preparations, and bolstering

psychological acumen. The transcription of video materials served as a conduit for identifying knowledge lacunae and delineating precise learning objectives, thereby enriching the study's efficacy.

Discussion

The integration of the TA approach into teaching rounds for new nurses has proven instrumental in improving their clinical reasoning skills. Clinical reasoning, a multifaceted cognitive process encompassing the collection, analysis, evaluation, and prioritization of patient information, underwent a marked enhancement through this pedagogical intervention [26]. Findings underscored a significant disparity in case analysis scores, showcasing a superior clinical reasoning adeptness in the observation group compared to the control group, substantiating the method's efficacy in fortifying nurses' prompt and precise decision-making in intricate clinical scenarios, This is consistent with previous research findings [27]. The incorporation of TA not only empowered new nurses through three-step thinking path training but also fostered their engagement in autonomous thinking during case reporting, thereby galvanizing comprehensive learning experiences intertwined with modern educational techniques, optimizing the fusion of passive and active learning methodologies, and elevating learning efficiency. The interactive dialogue sessions post case reports further catalyzed a collaborative learning environment, fostering mutual knowledge exchange and concept application, thereby bolstering new nurses' reflective learning practices and augmenting their clinical reasoning proficiency.

Furthermore, the implementation of the TA approach within nursing rounds evidenced a profound impact on enhancing critical thinking abilities among new nurses. Manifested through the amplification of cognitive faculties such as thinking, application, analysis, synthesis, and evaluation within varied scenarios [28–30], this approach fueled a transformative surge in individual and cumulative critical thinking scores in the observation group post-rounds, eclipsing those in the control group. Noteworthy dimensions like truth-seeking, open-mindedness, self-assurance, and curiosity exhibited substantive improvements among observation group nurses, accentuating the TA approach's role in stimulating inquisitiveness and nurturing self-assurance. Augmented analytical and systematization competencies were also noted among the observation group, elucidating the tangible benefits derived from three-step thinking path training, independent case reporting utilizing TA approach, and immersive simulation exercises. These results mirror existing literature emphasizing TA approach' s positive impact on clinical and critical reasoning abilities among nursing cohorts, substantiating the efficacy of this pedagogical approach in nurturing critical thinking skills within new nurses [32, 33].

Moreover, the utilization of the TA approach in teaching rounds for new nurses heralded transformative benefits in adjusting training strategies within cancer hospitals. An in-depth analysis of learning strategies employed by the observation group during case reporting sessions unveiled an informative landscape of meta-cognitive, cognitive, and social/emotional strategies utilization rates. While cognitive strategies were prevalent, meta-cognitive strategies exhibited a noticeable gap, emphasizing the pivotal role of nurturing meta-cognitive aptitude in enhancing learning norms and overall educational quality [34]. Alarmingly low usage rates of social/emotional strategies signaled the imperative need for bolstering nurses' psychological and team-oriented competencies. Clinical nursing leaders are urged to curate collaborative learning opportunities, foster psychological resilience, energize teamwork dynamics, and prioritize meta-cognitive training within the nursing curricula to foster holistic nursing skills development. The amalgamation of video-recorded case reports into written materials emerged as a valuable tool for educators and students alike, facilitating a nuanced comprehension of individual knowledge levels, thereby enabling tailored teaching and learning strategies for optimal pedagogical outcomes.

Limitations

There are some limitations to this study, in particular the lack of post-training follow-up assessment due to the rotation of new nurses every three months, which hindered long-term efficacy assessments. However, periodic quarterly evaluations serve as a robust mechanism to continually appraise clinical knowledge and practice quality among new nurses. Furthermore, the singular focus on a solitary cancer hospital could limit the study's generalizability, warranting a multicenter, large-scale, long-term evaluation to comprehensively assess the TA approach's industry-wide impact.

Conclusions

The integration of the TA approach has been correlated with enhanced clinical competencies among nurses, reflecting an intrinsic alignment with the dynamic demands of nursing practices within cancer hospital settings.

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Author contributions
RZ: wrote, reviewing and editing the main manuscript tex, methodology, data curation. TTD, JPM, ML, HLM : prepared Tables 1, 2, 3 and 4, data collection. All authors reviewed the manuscript. All authors have approved the final article to be published.

Funding
None.

Data availability
The datasets used and analysed during the current study were available from the Correspondence author on reasonable request.

Declarations

Ethics approval and consent to participate
The study was reviewed and approved by the Ethics Committee of Henan Cancer Hospital.The project was also designed in accordance with the Declaration of Helsinki (beneficence, nonmaleficence, autonomy and justice). In our study, informed consent was obtained from all subjects. We guaranteed all the participants the confidentiality of their private information and their right to withdraw from the study at any stage.

Consent for publication
Not applicable.

Generative AI and AI-assisted technologies in the writing process
No AI tools/services were used during the preparation of this work.

Competing interests
The authors declare no competing interests.

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