

## Retraction

# Retracted: Individualized Management of Quality of Care in Orthopedic Nurses Based on Sensitive Indicators

## Computational and Mathematical Methods in Medicine

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

## References

- [1] W. Zhang, X. Huang, and T. Huang, "Individualized Management of Quality of Care in Orthopedic Nurses Based on Sensitive Indicators," *Computational and Mathematical Methods in Medicine*, vol. 2023, Article ID 1950220, 8 pages, 2023.

## Research Article

# Individualized Management of Quality of Care in Orthopedic Nurses Based on Sensitive Indicators

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**Background.** Sensitive indicators of nursing quality focus on the core elements of nursing quality management. Nursing-sensitive quality indicators will play an increasingly important role in the macro and micro management of nursing quality in my country. **Objective.** This study were aimed at formulating the sensitive index management of orthopedic nursing quality based on individual nurses for improvement of the quality of orthopedic nursing. **Methods.** Based on the previous literature, the existing challenges in the early application of the orthopedic nursing quality evaluation index were summarized. Moreover, the management system of the orthopedic nursing quality-sensitive index based on individual nurses was devised and implemented, including monitoring the structure and result indices of individual nurses on duty and sampling the process indicators of patients managed by individual nurses. At the quarter-end, the data analysis was performed and fed back to determine the key points of the changes in the quality of specialized nursing affecting the individual, and the PDCA method was utilized for persistent improvement. The changes of sensitive indices of orthopedic nursing quality before (July–December 2018) and 6 months after implementation (July–December 2019) were compared. **Results.** There were significant differences in other indices (accuracy of limb blood circulation assessment/accuracy of pain assessment/postural care pass rate/accuracy of rehabilitation behavioral training/satisfaction of discharged patients) ( $P < 0.05$ ). **Conclusion.** The formulation of an individual-based orthopedic nursing quality-sensitive index management system modifies the traditional quality management model, improves the specialized nursing level, contributes to the accurate core competence training of specialized nursing, and improves the quality of specialized nursing of individual nurses. Consequently, there is an overall improvement in the specialized nursing quality of the department, and fine management is attained.

## 1. Introduction

The sensitive indicators of nursing quality are nursing guidelines, regulations, procedures and methods formulated according to the content, characteristics, processes, management requirements of nursing work, and the characteristics and needs of nursing staff. Sensitive indicators of nursing quality are also yardsticks for measuring nursing work. The establishment of a systematic, scientific, and advanced nursing standardization system is conducive to improving the quality of nursing and nursing management and promoting the development of nursing disciplines and the train-

ing of nursing talents. On the basis of the above standards, each hospital formulates basic nursing quality standards, critically ill patient nursing quality standards, nursing documentation quality standards, and other standards but lacks specialist nursing quality standards. In the field of orthopedic nursing, domestic and foreign countries only focus on the evaluation of certain orthopedic diseases or individual nursing problems and lack comprehensive and overall orthopedic nursing quality standards. Sensitive indicators of nursing quality focus on the core elements of nursing quality management, and nursing-sensitive quality indicators will play an increasingly important role in the macro-

and micromanagement of nursing quality in my country. Quantitatively identify nursing practices that are most relevant to patient outcomes in an effort to improve patient safety and quality of care [1, 2]. The indicator management process includes data collection, quality control, data processing, and analysis, identifying key points of changes in nursing quality, selecting implementation measures, and improving program evaluation [3, 4].

Previously, indicator management was based on the integrity level of wards, departments, and hospitals [5–8]; however, the individualized management of nursing quality based on evaluation indicators has not yet been reported. At an early stage, the research team designed 10 sensitive indicators of orthopaedic care quality [9]. The application process mainly includes the following: based on the challenges of data collation, data processing, and analysis at the ward level, the determination of the focus of complete change in nursing quality, and the relatively common selection of implementation measures and improvement projects; giving full play to the enthusiasm of nurses, leading to passive inspection and improvement is challenging; comparing quality differences among nurses is challenging and not conducive to performance appraisal. Considering the above challenges, we implemented individualized management of the nursing quality of orthopaedic nurses based on sensitive indicators and achieved satisfactory results. The research team constructed 10 sensitive indicators of orthopaedic nursing quality in the previous research. During the application process, it was found that there is no corresponding standard, which is likely to cause different scales of evaluators, lack of homogeneity, and insufficient conversion into specific nursing behaviors, in order to establish an intrinsic link between indicators and standards to drive continuous improvement in the quality of specialist care.

## 2. Objects and Methods

**2.1. Objects.** The Department of Orthopedics of our hospital is a national key construction discipline, integrating trauma, joint, and spine surgeries, bone oncology, microsurgery, sports medicine, and other specialized disease treatment disciplines. Seventy-seven orthopedic nurses were included as the study participants, with the age ranging from 22 to 42 (29.69, 5.34) years; title: one deputy chief nurse (1.30%), 13 chief nurses (16.88%), 51 nurse practitioner (66.23%), and 12 nurses (15.58%); working years: 29 (37.66%) with <5 years, 30 (38.96%) with 5–10 years, seven (9.09%) with 11–15 years, and 11 (14.29%) with >15 years; and posts: 19 nursing team leaders or specialized nurses (24.68%), 22 senior nurses (28.57%), and 36 junior nurses (46.75%).

The following are the inclusion criteria: (i) clinical practical nurses registered with the Provincial Health Commission, (ii) clinical practical nurses registered with the Provincial Health Commission, (iii) clinical practical nurses registered with the Provincial Health Commission, with at least orthopaedic nursing work (1 year). The following are the exclusion criteria: (i) nursing managers (head nurses), nurses without a nursing practice certificate were excluded; (ii) working in orthopaedics for <1 year, with long-term

leave; and (iii) sick leave, maternity leave; or studying abroad for more than 15 days (nurse).

### 2.2. Methods

**2.2.1. Establishment of Sensitive Indicators of Orthopedic Nursing Quality.** In 2018, based on the previous research and practices of 48 orthopedic nursing quality evaluation indicators [10], the research team summarized the existing problems, searched domestic and foreign literature, and using the Delphi method formulated 10 orthopedic nursing quality sensitive indicators, such as limb blood circulation evaluation accuracy, posture nursing qualification rate, rehabilitation behavior training accuracy, and deep vein thrombosis incidence rate. The expert authority coefficient of two rounds of expert inquiry was 0.902. The results obtained were credible, with positive coefficients of 0.96 and 1.00. After two rounds of expert consultation, the coefficient of variation was 0–0.27, and the coefficient of coordination was 0.36–0.68 ( $P < 0.05$ ). Structural indicators (include 1.1 as shown in Table 1) were collected by daily registration, process indicators (2.1–2.4) by field assessment, and result indicators (3.1–3.4) by clinical data statistics (chart review) or satisfaction survey. Each index defines its connotation, evaluation elements, and calculation formula, as shown in Table 1. The evaluation criteria of specialized nursing quality were established, such as limb blood circulation, nerve function, axis turnover operation, plaster fixation patient care operation, spinal cord injury patient handling standards, and various auxiliary equipment use standards according to the indicators.

### 2.2.2. Implementation of Personalized Management of Orthopedic Nurses' Nursing Quality Based

**(1) Establishment of a Specialist Nursing Quality Control Group.** In January 2019, a specialist nursing quality control group was established. The group members comprised the department nursing director, district nursing director, and specialist nurses, with a total of 10 members. The inclusion criteria for team members were bachelor degree or above; rigorous scientific fact-finding attitude; rich nursing expertise, strong thinking, and judgment; experience in nursing quality evaluation; 10 or more years of experience in orthopedic nursing or management; and intermediate level or above. The responsibilities of the team members include organizing core competency training based on sensitive indicators and performing individual nursing quality personalized management (data collection, quality control, data processing and analysis, data feedback, and improvement project evaluation) for individual nurses based on sensitive indicators.

**(2) Core Competency Training Based on Sensitive Indicators.** The core competency training of orthopedic nurses includes the theoretical knowledge and practical skills related to sensitive indicators which are included as important elements of clinical practice competency. From January to March 2019, pretraining on personalized management of nursing quality of orthopedic nurses is organized and implemented. Content

TABLE 1: Orthopedic nursing quality sensitive indicators.

Secondary indicators	Connotation of indicators and evaluation elements	Calculation formula
1.1 Nurse-patient ratio	The ratio between the number of nursing staff and the number of patients	The sum of the number of patients per shift per day/the sum of the number of charge nurses per shift per day during the statistical cycle
2.1 Accuracy of limb blood circulation assessment	Local or affected limb tissue temperature, skin color, capillary filling response, swelling, and arterial pulsation with correct content, frequency, method, and timing	Number of patients assessed accurately/total number of patients sampled
2.2 Accuracy of neurological function assessment	Sensory, muscle strength, motor, reflex, and autonomic function in the spinal cord, peripheral innervated areas with the correct content, frequency, method, and timing	
2.3 Accuracy of pain assessment	Accurate pain assessment tools include pain time, location, degree, nature, duration, resting and active pain, concomitant symptoms, and the impact of pain on daily life, sleep, psychology, and functional activities, pain level after pharmacological analgesia	
2.4 Postural care pass rate	Appropriate postural pillows; necessary protective measures; correct and safe postural transfer; patients master the purpose, method, and precautions of functional or therapeutic position and transfer	Number of patients with accurate postural care/total number of patients sampled
2.5 Accuracy of rehabilitation training	Work with the physician to develop an individualized exercise program, include a method, amount, frequency, and time of exercise from preoperative to the post-discharge phase; appropriate assistive devices; patients exercise appropriately and progressively	Number of patients with accurate rehabilitation training/total number of patients sampled
3.1 Incidence of external fixation complications	Include compartment syndrome, instrument-related pressure injury, ineffective traction, skeletal traction displacement, and traction needle crossing infection	Number of patients with external fixation complications/person-days of patients with internal fixation in the statistical cycle
3.2 Incidence of deep vein thrombosis	Diagnosed by color Doppler ultrasound	Number of patients with deep vein thrombosis/number of patient days in the statistical cycle
3.3 Incidence of respiratory obstruction in high-risk patients	High-risk patients: cervical spine injury, advanced age (70 years), infants and children, anterior cervical spine surgery, and patients who underwent a tracheotomy.	Number of high-risk patients with respiratory obstruction/number of patient-days of high-risk patients in the statistical cycle
3.4 Discharge patient satisfaction	Satisfaction with the pain control, discharge notification, and services	Uniform assessment form: the patient satisfaction questionnaire (third-party survey is conducted by hospitals with conditions)

of the training included overview and interpretation of orthopedic nursing quality sensitive indicators, the connotation of indicators theoretical knowledge, nursing processes, and standards and application of orthopedic nursing quality sensitive indicators for nursing quality management; methods of training and assessment: theoretical lectures, case teaching, operation demonstrations, business visits, objective structured clinical examinations, skill training, and assessment; training hours: 120 h/person.

(3) *The Specialist Nursing Quality Control Team Performing Individualized Monitoring and Improvement of Indicators.* Individualized monitoring of structural indicators (nurse-patient ratio) and some outcome indicators (incidence of external fixation complications, deep vein thrombosis, and respiratory obstruction in high-risk patients) are conducted, that is, monitoring the nurse-patient ratio and outcome

indicators during the shift of the responsible nurse. Patients who were under the charge nurse's supervision throughout the hospital stay were monitored for outcome indicators (patient satisfaction at discharge). To investigate satisfaction, the hospital's revised "Patient Satisfaction Questionnaire" was distributed at the time of discharge, which included patient satisfaction with the medical environment, quality of care, professional skills of nurses, and service attitude of nurses. The survey forms were placed in the satisfaction survey box by patients or family members to reduce human interference factors. The process indicators including accuracy of blood circulation assessment in limbs, the accuracy of neurological function assessment, the accuracy of pain assessment, the passing rate of postural care, and accuracy of rehabilitation behavior training of the patients under the charge of this responsible nurse were sampled, and record forms were filled out. Moreover, members of the quality

control team served as quality inspectors, and each nurse was continuously sampled for each indicator five times/quarter, and the total number of times each nurse sampled for the five indicators was 25 per quarter. The quality of the nurses' process of implementing specialized care was assessed to determine if the content was comprehensive, the method was correct, and the results were consistent with the quality inspector's evaluation. When the two evaluation results were inconsistent, another quality inspector made a judgment, and if necessary, the competent professor of the patient was asked to implement the evaluation and provide guidance.

Quarterly data entry of quality evaluation was performed to establish a database of sensitive indicators of orthopedic nursing quality based on individual nurses. At the end of each quarter, the quality management team analyzed the above data by calculating each nurse's indicator value, comparing the growth rate of each nurse's indicator value to the previous quarter, comparing the difference in indicator values between nurses at the same level of position, comparing the difference between each nurse's indicator value and the indicator target value for nurses in the same level of position, and providing feedback to the individual nurse on the results of the analysis and the individual finding the impact of individual specialty nursing. The results of the analysis are fed back to the individual nurse, and the individual identifies priorities for continuous improvement that affect individual specialty care changes. Simultaneously, targeted training is provided at the ward and unit level for nurses with large differences in indicator values and fluctuating indicator values, and specialty nursing core competency training is implemented based on individual nurses. For example, the pain assessment accuracy of a nurse's patients was the lowest among the process indicators and lower than the pain assessment accuracy of nurses in the same level of positions. The individual detected that the reasons affecting his low pain assessment accuracy were his lack of mastery of the use of different pain assessment scales, subjective judgment during pain assessment, and lack of timely assessment after implementing pain interventions. The individual proposed improvement measures, including changing the concept of pain, believing in the patient's chief complaint, learning relevant knowledge, and writing a case report on pain assessment in conjunction with the case; asking the district nurse manager or pain specialist nurse for bedside guidance; and self-evaluating the accuracy of pain assessment and comparing it with the evaluation results of the QI officer.

**2.2.3. Statistical Analysis.** Statistical analysis was performed using SPSS 20.0 software to compare changes in orthopedic nursing quality sensitivity indicators before implementation (July–December 2018) and 6 months after implementation (July–December 2019). Percentages were used for descriptive analysis and the  $\chi^2$  test was used to compare the differences between the two groups with a test level of  $\alpha = 0.05$ . The types of diseases in which nurses performed care before and after implementation included extremity fractures, mul-

tiple injuries, pelvic fractures, brachial plexus injuries, hand trauma, osteoarthritis of the knee, femoral head necrosis, femoral neck fractures, femoral trochanter fractures, knee ligament injuries, knee meniscal injuries, lumbar disc herniation, cervical spondylosis, scoliosis, spinal cord injury, spinal fracture, extremity bone tumor, and sacral tumor. The differences in patients' sex, age, diagnosis, surgery, and condition classification were comparable and not statistically significant ( $P > 0.05$ ). The results of the discharge patient satisfaction survey were selected for statistical analysis from the questionnaires completed by patients who had implemented the process index evaluation.

### 3. Results

There was no significant difference in the nurse-patient ratio of nurses in charge of the same post before and after the intervention ( $P > 0.05$ ). The incidence of external fixation complications in high-risk patients was 0.65%, the incidence of deep vein thrombosis was 0.52%, and the incidence of respiratory obstruction was 0.13%. In high-risk patients, the incidence of deep vein thrombosis was 0.13% and the incidence of respiratory obstruction was 0. Comparing the process indicators of nurse management at different levels with the results of patient discharge satisfaction, all indicators except the accuracy rate of neurological function assessment of patients in the nursing management of level 3 and the satisfaction rate of discharged patients from nursing group leaders or specialist nurses have statistics difference in science ( $P < 0.05$ ). See Tables 2–4.

### 4. Discussion

With the gradual formation of a consensus on the concept of "evidence-led improvement to replace evidence-based management," nursing-sensitive quality indicators will play an increasingly important role in the macro- and micromanagement of nursing quality in my country [11]. In recent years, researches on nursing-sensitive quality indicators have appeared one after another in my country, but the application of indicators is single, and most of them are based on the three-level quality control of nursing department-department-department and head nurse [12–15]. Individuals "do not know what the challenge is, do not know if the problem is related to the individual, do not know what my quality level is" and a series of confusions [16]. According to the epistemology of Marxism, the internal cause is the basis of change, the external cause is the condition of the change, and the external cause works through the internal cause [17]. Quality is prepared by individual nurses, and continuous improvement of quality is a process of active learning and improvement, rather than a process of passive improvement by individual nurses [18]. The results show that the index management based on individual nurses can timely feedback the quality level of nurses to individual nurses, making the quality evaluation more scientific and accurate; based on the index evaluation of individual nurses, the index results of all nurses in a certain period of time are summarized to form the overall quality [19]. At the

TABLE 2: Comparison of orthopedic nursing quality sensitive index values of primary charge nurses before and after implementation.

Group	Group Total sampled visits	Accuracy of limb blood circulation assessment (%)		Accuracy of neurological function assessment (%)		Accuracy of pain assessment (%)		Postural care pass rate (%)		Accuracy of rehabilitation behavioral training (%)		Discharge patient satisfaction (%)	
		The accurate number of persons	%	The accurate number of persons	%	The accurate number of persons	%	Qualified number of persons	%	The accurate number of persons	%	Number of persons satisfied	%
Pre-implementation	360	333	92.50	332	92.22	339	94.17	341	94.72	335	93.06	342	95.00
Post-implementation	360	346	96.11	336	93.33	353	98.06	352	97.78	348	96.59	352	97.78
$\chi^2$		4.37		0.33		7.28		4.66		4.82		3.99	
P		0.04		0.57		0.01		0.03		0.03		0.04	

TABLE 3: Senior charge nurses before and after implementation Comparison of orthopedic care quality sensitivity index values.

Group	Total sampled visits	Accuracy of limb blood circulation assessment (%)		Accuracy of neurological function assessment (%)		Accuracy of pain assessment (%)		Postural care pass rate (%)		Accuracy of rehabilitation behavioral training (%)		Satisfaction of discharged patients (%)	
		The accurate number of persons	%	The accurate number of persons	%	The accurate number of persons	%	Qualified number of persons	%	The accurate number of persons	%	Satisfied number of persons	%
Preimplementation	220	209	95.00	205	93.18	210	95.45	208	94.55	206	93.64	211	95.91
Postimplementation	220	218	99.09	207	94.09	218	99.09	217	98.64	217	98.64	217	98.64
$\chi^2$		5.07		0.15		4.2		4.42		4.46		2.14	
P		0.02		0.7		0.04		0.04		0.04		0.14	

TABLE 4: Comparison of orthopedic quality of care sensitivity index values for nursing team leaders and specialist nurses before and after implementation.

Group	Total sampled visits	Accuracy of limb blood circulation assessment (%)		Accuracy of neurological function assessment (%)		Accuracy of pain assessment (%)		Postural care pass rate (%)		Accuracy of rehabilitation behavioral training (%)		Satisfaction of discharged patients (%)	
		The accurate number of persons	%	The accurate number of persons	%	The accurate number of persons	%	Qualified number of persons	%	The accurate number of persons	%	Satisfied number of persons	%
Preimplementation	190	182	95.79	184	96.84	179	94.21	181	95.26	180	94.74	186	97.89
Postimplementation	190	189	99.47	187	98.42	188	98.95	189	99.47	188	98.95	189	99.47
$\chi^2$		4.1		0.46		5.1		5.03		5.99		0.81	
P		0.04		0.50		0.02		0.03		0.01		0.37	

$P < 0.05$ ; when frequencies were less than 5, a continuity-corrected chi-square was used for testing.

professional level, it avoids the quality deviation that may have been caused by unreasonable quality monitoring in the past, and truly reflects the overall results [20]. This avoids the quality deviation that may be caused by unreasonable quality monitoring in the past, truly reflects the

overall quality level, and is conducive to continuous quality improvement at the professional level.

Our study found no statistically significant difference in the proportion of nurses and patients in the same post before and after the intervention. The incidence of external

fixation complications in high-risk patients was 0.65%, the incidence of deep vein thrombosis was 0.52%, and the incidence of respiratory obstruction was 0.13%. In high-risk patients, the incidence of deep vein thrombosis was 0.13% and the incidence of respiratory obstruction was 0. The reason for the analysis is as follows: Because of the relatively stable nurse-to-patient ratio, the level of professional care in the department is reflected in the difference between the quality of the process and the outcome [21]. The evaluation of the professional nursing level before implementation is based on the overall professional level, from which it is found that the quality level of a certain nurse at a certain point in time is often fragmented and one-sided; after implementation, it can be comprehensive from individual nurses to the entire nurse system, reflecting the level of professional nursing [22]. Sensitive indicators of orthopaedic nursing quality, such as the accuracy rate of limb blood circulation assessment, the accuracy rate of neurological function assessment, the qualified rate of posture nursing, and the accuracy rate of rehabilitation behavior training, involve the whole process of orthopaedic specialist nursing, and have complex, diverse, and variable characteristics. There were no statistically significant differences in the accuracy of neurological assessments among nurse-managed patients across the three levels of positions, indicating the challenges of accurate neurological assessments and the lack of accurate identification of high-risk patients with preexisting or potential neurological impairments by nurses. [23]. Preexisting nerve injury usually occurs by cutting, pulling, and pinching; underlying nerve injury usually occurs as a result of hematoma compression, displacement of internal fixation, and complications of therapeutic procedures [24]. Nurses are often unable to actively observe and predict conditions, resulting in failed assessments. Thus, the goal of accurate assessment can be achieved by actively seeking clues, inquiring and making judgments, enhancing medical and nursing communication, and familiarizing with the cause of injury, surgery, and condition by responsible nurses [25]. The results show that continuous quality monitoring based on individual nurses can standardize nursing behavior and improve nurse compliance, thereby improving efficiency and quality [26]. To sum up, the value of sensitive indicators of orthopaedic nursing quality has gradually increased from primary and senior supervisor nurses to nursing team leaders and specialist nurses, and the level of qualifications, experience, knowledge, and skills has been continuously improved. Match workload, patient condition and nursing needs, and nurses' specialist care level [27]. This will further improve the quality of specialist care by ensuring that nurses provide higher quality care for Charlinger and critically ill patients.

Our study found that when comparing the process indicators of nurse management at different levels with patient discharge satisfaction outcomes, all patients except for the accuracy of neurological function assessment and patient satisfaction at discharge from nursing group leaders or specialist nurses in level 3 nursing management All indicators were statistically different. The reasons for the analysis are as follows: the assessment and management of nursing qual-

ity should be based on professional standards of nursing [28]. Nursing professional standards are an important part of the core competency training of nursing professions. Research shows that the training and evaluation of core competence of orthopaedic specialist nursing mainly includes theoretical knowledge, professional lethality, and comprehensive practical skills. The training mostly adopts group lectures, operation demonstrations, business visits, and difficult case discussions. This is training and assessment implemented from the holistic level of the orthopaedic education profession, which is a common clinical approach [29–32]. With the development of holistic nursing, responsible nursing, high-quality nursing, and evidence-based nursing, as well as the arrival of the era of precision medicine, the precise training of core competencies in specialist nursing is particularly urgent. The positioning of our precision training is that the training needs of nurses come from the evaluation of quality indicators. The quality inspectors monitor individual nurses with the accurate implementation of nursing professional standards as the yardstick. When the quality deviates from the standard, they immediately supervise and repeat the training to realize the core ability of accurate professional nursing. At the same time, the core competitive training of precision specialist nursing develops with the professional development. Nursing professional standards and corresponding operating procedures should be formulated and revised in a timely manner, professional core skills should be improved, nurses should be clearly instructed, and targeted training should be carried out [33]. After the completion of the design of the valve blood circulation observation ruler, the operation procedure of the flap blood circulation assessment was revised in time. After intensive training, the head nurse tested the nurse's mastery degree when assessing the accuracy of the limb blood circulation assessment, and immediately found a problem.

Based on individual nurses, this study implemented the management of sensitive indicators of orthopaedic nursing quality, and further explored the application value of sensitive indicators of specialized nursing quality. Facts have proved that both managers and individual nurses can accurately find the weak links in nursing according to the changes in the indicator data, thereby improving the professional nursing quality of individual nurses, thereby improving the overall professional nursing quality of the department, and achieving refinement. This study was limited to the orthopaedic ward in our hospital, and future research may include a multicenter study to further improve the management of sensitive indicators of orthopaedic care quality based on individual nurse practice.

## Data Availability

No data were used to support this study.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

## References

- [1] S. Burston, W. Chaboyer, and B. Gillespie, "Nurse-sensitive indicators suitable to reflect nursing care quality: a review and discussion of issues," *Journal of Clinical Nursing*, vol. 23, no. 13-14, pp. 1785–1795, 2014.
- [2] R. M. Gallagher and P. A. Rowell, "Claiming the future of nursing through nursing-sensitive quality indicators," *Nursing Administration Quarterly*, vol. 27, no. 4, pp. 273–284, 2003.
- [3] Z. Li, S. Cheng, L. Lv, S. Xy, and X. H. Liu, "The application of nursing-sensitive quality indicators in evaluating nursing efficacy," *La Clinica Terapeutica*, vol. 165, no. 5, p. e342-5, 2014.
- [4] A. Chen, X. Jiang, F. Lian, J. Wu, X. Weng, and W. Li, "Application and Effectiveness of Big Data and Artificial Intelligence in the Construction of Nursing Sensitivity Quality Indicators," *Journal of Healthcare Engineering*, vol. 2021, Article ID 2087876, 2021.
- [5] M. C. Callanan, B. Jarrett, C. R. Bragdon et al., "The John Charnley Award: risk factors for cup malpositioning: quality improvement through a joint registry at a tertiary hospital," *Clinical Orthopaedics and Related Research®*, vol. 469, no. 2, pp. 319–329, 2011.
- [6] J. D. Baker, "Nursing research, quality improvement, and evidence-based practice: the key to perioperative nursing practice," *AORN journal*, vol. 1, no. 105, pp. 3–5, 2017.
- [7] C. Fengjiu, Y. Chunzi, and L. Mei, "Establishment and application of quality indicators for cancer pain management based on information technology platform," *Journal of Nursing*, vol. 35, no. 24, pp. 12–14, 2020.
- [8] S. M. Davies, J. Geppert, M. McClellan, K. M. McDonald, P. S. Romano, and K. G. Shojania, *Refinement of the HCUP Quality Indicators Rockville*, Agency for Healthcare Research and Quality, MD, 2001.
- [9] J. F. Timsit, J. Baleine, L. Bernard et al., "Expert consensus-based clinical practice guidelines management of intravascular catheters in the intensive care unit," *Annals of Intensive Care*, vol. 10, no. 1, pp. 1–26, 2020.
- [10] V. P. Nichols, F. Toye, S. Eldabe, H. K. Sandhu, M. Underwood, and K. Seers, "Experiences of people taking opioid medication for chronic non-malignant pain: a qualitative evidence synthesis using meta-ethnography," *BMJ open*, vol. 10, no. 2, p. e032988, 2020.
- [11] W. Li, Y. Wen, Y. Du et al., "Development and clinical application of nursing-sensitive indicators for midline catheterization care using evidence-based methods," *Annals of Palliative Medicine*, vol. 10, no. 1, pp. 425–433, 2021.
- [12] "40th International Symposium on Intensive Care & Emergency Medicine 2021," *Critical Care*, vol. 25, Supplement 1, p. 383, 2021.
- [13] H. Jin, A. Chalkidou, M. Hawkins et al., "Cost-effectiveness analysis of stereotactic ablative body radiation therapy compared with surgery and radiofrequency ablation in two patient cohorts: metastatic liver cancer and hepatocellular carcinoma," *Clinical Oncology*, vol. 33, no. 3, pp. e143–e154, 2021.
- [14] P. Cai, Y. Q. Yang, and Y. H. Chen, "Construction of sensitive indicators of nursing quality in rehabilitation departments," *Nursing Research*, vol. 34, no. 2, pp. 343–346, 2020.
- [15] G. Juan and L. Guohong, "Construction of nursing-sensitive quality indicators in hematology," *Journal of PLA Nursing*, vol. 36, no. 10, pp. 9–12, 2019.
- [16] L. Akhu-Zaheya, R. Al-Maaitah, and H. S. Bany, "Quality of nursing documentation: paper-based health records versus electronic-based health records," *Journal of Clinical Nursing*, vol. 27, no. 3-4, pp. e578–e589, 2018.
- [17] K. O. Pei-Ying, H. O. Chen-Shie, and L. I. A. O. Pei-Hung, "The impact of a multilevel interactive nursing quality control and audit application on nursing quality management," *BMC Nursing*, vol. 20, no. 1, p. 243, 2021.
- [18] P. S. Moldskred, A. K. Snibbsøer, and B. Espehaug, "Improving the quality of nursing documentation at a residential care home: a clinical audit," *BMC Nursing*, vol. 20, no. 1, p. 103, 2021.
- [19] G. Gardner, A. Gardner, and J. O'Connell, "Using the Donabedian framework to examine the quality and safety of nursing service innovation," *Journal of Clinical Nursing*, vol. 23, no. 1-2, pp. 145–155, 2014.
- [20] K. Stewart, O. Doody, M. Bailey, and S. Moran, "Improving the quality of nursing documentation in a palliative care setting: a quality improvement initiative," *International Journal of Palliative Nursing*, vol. 23, no. 12, pp. 577–585, 2017.
- [21] N. Wang, P. Yu, and D. Hailey, "The quality of paper-based versus electronic nursing care plan in Australian aged care homes: a documentation audit study," *International Journal of Medical Informatics*, vol. 84, no. 8, pp. 561–569, 2015.
- [22] S. Poortaghi, M. Salsali, A. Ebadi, Z. Rahnavard, and F. Maleki, "Findings from a nursing care audit based on the nursing process: a descriptive study," *Nursing and Midwifery Studies*, vol. 4, no. 3, article e30181, 2015.
- [23] M. K. D. Skaggs, J. F. Daniels, A. J. Hodge, and V. L. DeCamp, "Using the evidence-based practice service nursing bundle to increase patient satisfaction," *Journal of Emergency Nursing*, vol. 44, no. 1, pp. 37–45, 2018.
- [24] V. Mac Donald, A. B. Maher, H. Mainz et al., "Developing and testing an international audit of nursing quality indicators for older adults with fragility hip fracture," *Orthopaedic Nursing*, vol. 37, no. 2, pp. 115–121, 2018.
- [25] N. Wang, D. Hailey, and P. Yu, "Quality of nursing documentation and approaches to its evaluation: a mixed-method systematic review," *Journal of Advanced Nursing*, vol. 67, no. 9, pp. 1858–1875, 2011.
- [26] M. Whalen, B. Maliszewski, H. Gardner, and S. Smyth, "Audit and feedback: an evidence-based practice literature review of nursing report cards," *Worldviews on Evidence-Based Nursing*, vol. 18, no. 3, pp. 170–179, 2021.
- [27] A. Gandhi, H. Yu, and D. C. Grabowski, "High nursing staff turnover in nursing homes offers important quality information," *Health Affairs*, vol. 40, no. 3, pp. 384–391, 2021.
- [28] Z. Shiyu and Y. Jiaohua, "Progress of research on quality sensitivity indicators in specialized nursing care," *Nursing Research*, vol. 33, no. 8, pp. 1342–1346, 2019.
- [29] G. Hongyan and X. Hong, "Implications of the nursing quality evaluation system in the United States for nursing quality management in China," *China Nursing Management*, vol. 14, no. 5, pp. 459–462, 2014.
- [30] L. Chunmei, S. Caiping, Z. Yumei, and J. Ren, "Construction of core competency evaluation index system for orthopaedic specialist nurses," *Chongqing Medicine*, vol. 44, no. 33, pp. 4686–4689, 2015.
- [31] R. Wilson, C. M. Godfrey, K. Sears, J. Medves, A. Ross-White, and N. Lambert, "Exploring conceptual and theoretical

- frameworks for nurse practitioner education: a scoping review protocol," *JBI Evidence Synthesis*, vol. 13, no. 10, pp. 146–155, 2015.
- [32] H. Li, J. Sun, Y. Zhou et al., "The utility of competency-oriented clinical laboratory teaching combined with case-based learning (CBL)," *Clinical Chemistry and Laboratory Medicine (CCLM)*, vol. 59, no. 11, pp. 1784–1789, 2021.
- [33] Y. Yao, L. Xu, K. Du, and J. Zhang, "The Effect and Clinical Application of Homemade Tracheotomy Incision Nursing Pads," *Cell biochemistry and biophysics*, vol. 70, no. 1, pp. 161–166, 2014.