Current Status of the Application of Surgical Specialty Nursing Quality Evaluation Indicators

Xiaohua Chen, Xiaojuan Ling, Jingwen Yan*

Sun Yat-sen Memorial Hospital, Sun Yat-sen University, Guangzhou 510120, Guangdong Province, China

Corresponding author: Jingwen Yan, 13719098531@163.com

Abstract: This paper reviews the current status of the application of surgical specialty nursing quality evaluation indicators both domestically and internationally. It covers the related concepts, theoretical foundations, construction methods, construction fields, application research, and existing shortcomings of these indicators. It suggests that scholars and researchers in the nursing field in China should base their work on mature theories, use scientific research methods, and construct a quality indicator system that aligns with China's surgical development, is practical, unified, suitable for the local context, and beneficial for the development of the surgical nursing discipline.

Keywords: Surgical specialty nursing; Quality evaluation index; Review

1. Introduction

In today's rapidly developing healthcare industry in China, hospital nursing quality remains a top priority in nursing management and a key component of overall quality control. These evaluation indicators are tools or methods used to assess healthcare decisions, nursing services, and patient outcomes, and they substantively demonstrate or express the quality of nursing care [1].

The earliest formal measurement showing nursing quality data appeared in the 1850s, when the great pioneer of nursing, Nightingale, used statistical methods to calculate the relationship between nursing work and patient outcomes. Since scholars began extensively applying the nursing indicator system in practice in the 1990s, broad data have updated our understanding of the significant positive impact on nursing quality reform [2]. The "National Nursing Development Plan (2021–2025)" emphasizes that one of the critical tasks for nursing development during the "14th Five-Year Plan" period is to promote high-quality development in nursing [3]. The U.S. Joint Commission [formerly the Joint Commission on Accreditation of Healthcare Organizations (JCAHO)] also established that nursing quality evaluation indicators are quantifiable tools [4]. With the ongoing progression of "Healthy China 2030," specialized nursing in China has seen rapid advancement. Compared to general nursing quality evaluation indicators, specialty indicators are more specific and closely aligned with clinical practice, promoting deeper development in specialty nursing quality [5].

Extensive practical data indicate that the construction and application of specialized nursing quality indicators in China are in a rapid development phase. As the healthcare industry becomes more specialized, a specialized indicator system is beneficial for promoting and standardizing the deep development of specialized nursing. The following is an overview of the development and application of specialized indicators in surgical specialties, both domestically and internationally.

2. Overview of specialty indicators

The Joint Commission defines nursing quality indicators as the quantifiable measures of nursing quality, serving to evaluate nursing quality and activities. Nursing quality indicators are quantifiable tools used to assess clinical nursing activities and the level of nursing quality [4]. Quality indicators are generally categorized into basic indicators and specialty indicators, with further extensions including sensitive indicators or specialty-sensitive indicators captured in clinical practice. Basic indicators are used to assess foundational quality, while specialty nursing quality indicators are often applied to evaluate the quality of specialty nursing, including the care of specific diseases. Some studies have shown that specialty nursing quality indicators better reflect the true quality of specialty nursing and are more effective than basic nursing quality indicators in promoting the development and enthusiasm for specialty nursing quality [6]. The primary criteria for selecting nursing evaluation indicators should include high specificity, collectability in work, wide recognition, and an inseparable link to quality. Indicators are a set of measurable tools that target various dimensions of behavior, processes, and outcomes and are widely and increasingly used in healthcare systems [7]. Podgorny [8] defines indicators as tools used to evaluate the most critical aspects of nursing. Mageskay *et al.* [9], from the patient's perspective, state that quality indicators reflect the patient's physiological status. The American Nurses Association (ANA) emphasizes that nursing indicators should be easily collectible in clinical practice and have high nursing specificity [10].

3. Development of specialty care quality indicators

3.1. Development models

In 1969, American scholar Donabedian [11] first established the "structure, process, outcome" three-dimensional quality structure model and elaborated on its connotations. This model applied quality evaluation to healthcare services, breaking away from traditional healthcare service quality evaluation indicators. Subsequently, the ANA [12] applied Donabedian's three-dimensional structure model in nursing quality control, which has been widely used by nursing scholars both domestically and internationally [13]. In addition, the continuous quality improvement theory advocated by Deming and the quality assurance model proposed by JCAHO is well-known in China's healthcare institutions for nursing quality management.

3.2. Development methods
3.2.1. Qualitative research methods

Qualitative research has always been the preferred method for developing indicators. Major methods include literature reviews, expert meetings, semi-structured interviews, and the Delphi method [14]. In the early 1980s, some foreign nursing experts introduced qualitative research into the nursing field, allowing it to advance rapidly [15]. In the 21st century, China's initial studies on constructing specialty indicators were often accompanied by qualitative research and extensively applied. Under scientific and rigorous research principles, flexible sampling and statistical techniques were employed to describe indicators, achieving significant phase results.

3.2.2. Quantitative research methods

Currently, there are two commonly used methods for constructing indicators: statistical analysis and the Analytic Hierarchy Process (AHP) [16].

3.2.3. The relationship between the two research methods

Today, qualitative research is primarily used for indicator selection, while quantitative research focuses on constructing the weight of indicators and verifying their reliability and validity. Wang Huan and Yu Jiaohua [17] noted that early nursing quality evaluation standards and indicators were mostly descriptive literature and empirical summaries, providing little evidence-based support. With the development of specialty nursing, most studies establishing specialty indicators now combine qualitative and quantitative methods. Chen Junyi *et al.* [18] pointed out that integrating qualitative and quantitative methods in research can maximize scientific rigor, marking a new trend in this research field. Therefore, combining both methods allows for complementarity, with qualitative and quantitative data collection results being mutually reinforcing. Researchers choose the appropriate research methods based on the specific situation in practical research.

4. Construction and application of specialty nursing quality indicators in surgery

4.1. Cardiac surgery nursing quality indicators

In 2005, a team led by Sun Lin [19] was the first to develop a nursing indicator system covering three modules—process, terminal, and overall—in cardiac surgery at a tertiary hospital. In recent years, the construction of nursing quality indicators for various surgical specialties and perioperative care has entered a phase of rapid development.

4.2. Orthopedic nursing quality indicators

In early 2013, a team led by Huang Tianwen [20-24] initially established 48 orthopedic specialty nursing quality evaluation indicators [20]. In 2017, they further developed 10 sensitive indicators for orthopedic nursing quality based on earlier research [21]. The team found that a lack of corresponding standards led to inconsistent evaluation criteria, lack of uniformity, and difficulty translating them into specific actionable nursing behaviors. To establish an internal link between indicators and standards and to promote continuous improvement in specialty nursing quality, the team explored the establishment of orthopedic specialty nursing quality standards based on sensitive indicators in 2022 [24].

4.3. Gastrointestinal surgery nursing quality indicators

In 2015, Wang Huan and Yu Jiaohua [25] employed a combination of qualitative and quantitative methods to develop gastrointestinal nursing quality evaluation indicators for general hospitals, based on Donabedian's "structure-process-outcome" theoretical framework. They used the Delphi method to refine the established hierarchical evaluation indicators and applied the Analytic Hierarchy Process (AHP) to determine the weight of each indicator, creating specialized nursing quality evaluation indicators for gastrointestinal surgery in general hospitals.

4.4. Operating room nursing quality indicators

In 2017, Qian Huiqing *et al.* [26] followed the three-dimensional framework theory to establish evaluation indicators. They conducted two rounds of expert consultations with 15 operating room management experts

using the Delphi method, screened the items preliminarily, and used AHP for data analysis to determine the weight of each indicator, thereby forming a quantitative system for clinical nursing management quality in the operating room. In 2019, Yan Zhe et al. [27] developed nursing quality indicators for day surgery centers, with clear, scientific, and practical item indicators.

4.5. Perioperative nursing quality indicators

Zhan Yuxin et al. [28], based on the three-dimensional quality structure model, constructed a perioperative nursing quality indicator system for hospitalized patients, providing objective evaluation standards for monitoring and continuously improving the quality of preoperative and postoperative nursing care.

4.6. Neurosurgical intensive care unit nursing quality indicators

Zhan Yuxin et al. [28] used Donabedian's three-dimensional quality model as a framework to establish neurosurgical intensive care unit (ICU) nursing quality evaluation indicators suited to the Chinese context, aiming to provide a scientific basis for evaluating and monitoring nursing quality in the neurosurgical ICU. The indicators are comprehensive and practical, promoting continuous improvement in the quality of neurosurgical ICU nursing care.

4.7. Other nursing fields

Subsequent to these developments, specialized quality indicators have been established in areas such as trauma spine surgery, parenteral nutrition nursing for inpatients, ostomy care for inpatients, PICC line care, and thrombus nursing quality evaluation systems. Zhang Guangqing et al. [29] developed a traditional Chinese medicine nursing quality indicator system. Lu Ye et al. [30] conducted nursing quality research on single-disease cases of breast cancer radical surgery. Xu Jing et al. [31] developed a perioperative enhanced recovery evaluation indicator system for lung cancer patients, using the Donabedian quality management model. Zhuang Yiyu [32] established a traceable indicator system for ICU nursing quality management based on data, creating a database and nursing management and evaluation system based on quality indicator data under the guidance of the hospital information monitoring system framework. Additionally, nursing managers have developed locally feasible ICU nursing quality-sensitive indicators based on the characteristics of their units and local needs. In practice, commonly seen indicators include unplanned extubation rate, catheter-related bloodstream infection rate, and ventilator-associated pneumonia management [33]. However, the scope of pilot studies remains limited, and there is not yet a universally applicable ICU nursing quality-sensitive indicator system that is standardized across major hospitals nationwide. Cheng Shouzhen et al. [34], in their reflection and practice of ICU nursing quality management, pointed out that the direction of nursing management primarily aims to ensure patient safety, improve nursing quality, and develop specialty nursing levels.

5. Summary

5.1. Current status and deficiencies in the construction of surgical nursing quality indicators domestically and internationally

Based on an extensive review of the literature, it is evident that research on specialty indicators abroad began earlier and is relatively mature. Meanwhile, domestic research in this area is also advancing rapidly and gaining increasing attention from scholars, with widespread interest across the country. Particularly in recent years, China has been experiencing a phase of rapid development, especially in various surgical specialties and single-

disease categories. However, the areas covered by research, the effectiveness of related applications, and the extent of dissemination still need further development. Many specialty indicators have been established, but they lack widespread clinical application and empirical validation, which are essential for ensuring their suitability and feasibility. Further exploration is needed by nursing experts in empirical studies and application effects in clinical practice to support the quality of clinical nursing work.

5.2. Current status and future prospects of quality indicators in enhanced recovery after surgery specialty nursing

In recent years, the field of Enhanced Recovery After Surgery (ERAS) has developed rapidly. The expert consensus and guidelines for various ERAS specialties have been updated from the 2015 version to the latest version. Nurses play a crucial role in the implementation and evaluation of ERAS. However, nursing management and quality evaluation in ERAS are significantly lagging. In research related to ERAS nursing quality evaluation, Li Jing *et al*. [35] integrated the 2018 version of the Chinese expert consensus on ERAS, aiming to improve ERAS nursing quality, with a focus on building and applying ERAS-specific nursing-sensitive indicators. This research plays an important role in ERAS nursing quality management. Due to the scarcity of ERAS-related nursing quality evaluation systems and specialty nursing indicators in China, nurses must consider not only the implementation and practice of ERAS concepts in daily work but also the standardization of specific specialties or diseases. Unified clinical pathway standards can help patients recover quickly, improve satisfaction, and reduce nurses' workloads, benefiting all parties involved. ERAS specialty evaluation standards can provide a uniform standard for nurses in quality control of patient implementation and work quality, facilitating quality control work and data quantification.

5.3. Norms and prospects for selecting and constructing surgical nursing quality indicators

Currently, the sources of clinical nursing quality evaluation indicators in China include international standards, the standards of the National Health Commission, the standards of the Jiangsu Provincial Health Department, hospital regulations, clinical nursing rounds records, and the "Compilation of Medical Quality Management and Control Indicators (2021 Edition)" published by the National Health Commission, which includes nursing specialty medical quality control indicators (2020 edition). However, there is no unified standard for selecting nursing quality indicators domestically or internationally, and the management methods are not comprehensive enough. The coverage is not broad, and the indicators lack specialty-specific relevance and comprehensive applicability. Further in-depth research is needed on specialty nursing quality indicators. To better implement "patient-centered" comprehensive high-quality nursing and improve service quality, the future construction of specialty indicators should integrate the three modules of structure, process, and outcome. It is suggested that the focus of the indicators should be broadened to include patient satisfaction, occupational health, nurse certification, and nursing costs, emphasizing a human-centered approach.

The team led by Xing Shuangshuang [36] made several useful suggestions regarding the scope, framework, methods, and content of specialty indicator systems: covering common and frequently occurring diseases; using Donabedian's three-dimensional quality structure model; employing scientific research methods such as evidence-based approaches and expert consultations; clearly defining each indicator, including the name, item definition, calculation formula, data collection method, and significance; and conducting clinical application and validation of the constructed indicator systems.

In summary, from the extensive construction and application practice of surgical specialty indicator systems, it is clear that the "structure indicators - process indicators - outcome indicators" system is

indispensable. Accurate data analysis can lead to more precise and scientific conclusions [20]. Additionally, it is essential to be targeted and specialty-specific when constructing quality indicators, as building on the specific characteristics and connotations of each specialty is beneficial for the development of specialty quality and better implementation in clinical practice, thus supporting clinical practice more effectively.

Disclosure statement

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