



Research Article

The Impact and Quality Improvement of Goal Management Combined with Humanized Nursing on General Surgery Nursing Outcomes

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Abstract

Objective: To preliminarily evaluate the impact of goal management combined with humanized nursing on patient outcomes and nursing processes in a general surgery ward.

Methods: A retrospective analysis was conducted on 130 general surgery patients (from March 2024 to March 2025). Patients were divided into control group (conventional nursing, n=65) and observation group (goal management combined with humanized nursing, n=65). Propensity score matching (PSM) and multivariable regression were applied to adjust for observable confounders. Primary outcome was hospital stay; secondary outcomes included postoperative pain (Numeric Rating Scale (NRS)), adverse events, patient satisfaction, and exploratory process measures (nursing competence and care quality scores).

Results: The observation group had significantly shorter hospital stay (8.17 ± 1.36 vs. 14.18 ± 2.25 days, $P < 0.001$) and lower NRS scores on postoperative days 1-3 (all $P < 0.05$). Adverse event incidence was lower (4.62% vs. 29.23% , $P < 0.05$), and patient satisfaction scores were higher (all $P < 0.05$). Exploratory analyses showed higher nursing competence and care quality scores in the observation group.

Conclusion: In this single-center retrospective study, goal management combined with humanized nursing was associated with improved patient outcomes and nursing process indicators. However, due to the quasi-experimental design and lack of blinding, these findings should be interpreted as preliminary and hypothesis-generating. Rigorous multicenter randomized controlled trials are warranted.

Keywords: goal management, humanized nursing, general surgery nursing, nursing effectiveness, quality improvement

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1 INTRODUCTION

General surgery, as the largest specialty within the surgical system, encompasses the treatment of multisystem diseases involving the hepatobiliary-pancreatic, gastrointestinal, mammary gland, and thyroid systems, among others, and is characterized by high surgical risks, prolonged postoperative recovery periods, and elevated risks of complications^[1,2]. Traditional nursing models often result in inconsistent care quality due to ambiguous objectives and inadequate communication, leading to issues such as delayed pain management, weak infection prevention and control, and insufficient psychological support, which directly affect patient prognosis and satisfaction. In recent years, the medical paradigm has shifted from a biomedical model to a "biological-psychological-social" approach, demanding that nursing services balance scientific rigor with humanistic care. This transition has made the collaborative application of goal management and humanized nursing a research focus^[3-5].

Goal management enhances the systematic and standardized nature of nursing by quantifying nursing objectives, decomposing tasks, and conducting dynamic evaluations. Studies have shown that after implementing hierarchical management of nurses through goal management in general surgery departments, the incidence of nursing negligence significantly decreased, while management quality scores improved^[6,7]. Meanwhile, humanized nursing, centered on patients, strengthens adherence and shortens recovery periods by optimizing the environment, providing psychological support, implementing multimodal pain management (e.g., dynamic adjustment of Numeric Rating Scale (NRS) scores), and involving families, thereby highlighting its clinical value^[8]. However, single-mode approaches have limitations: goal management may overlook patients' psychological needs, while humanized nursing is prone to implementation deviations due to ambiguous objectives. Combining the two creates a synergistic effect—goal management provides a structured framework, while humanized nursing supplements humanistic care, jointly optimizing nursing outcomes. Current research predominantly focuses on single models, lacking systematic evaluations of their combined application. This study retrospectively analyzed 130 general surgery patients at our hospital from March 2024 to March 2025, comparing the differences between goal management combined with humanized nursing and conventional care. It explored their impacts on hospital stay duration, pain control, adverse event incidence, patient satisfaction, and nursing quality, providing empirical evidence for clinical nursing model innovation with significant potential for widespread adoption.

2 MATERIALS AND METHODS

2.1 Study Design

This study was designed as a retrospective analysis, incorporating medical records of patients treated in the general surgery department of our hospital from March 2024 to March 2025 as the research subjects to ensure sample representativeness. After rigorous screening based on inclusion criteria, a total of 130 patients were enrolled in this study. Patients were divided into a control group (conventional nursing management) and an observation group (goal management combined with humanized nursing) according to nursing models, with propensity score matching (PSM) used to balance baseline data. Each group included 65 patients. The study was strictly adhered to the ethical guidelines outlined in the Declaration of Helsinki and relevant national medical data protection regulations. Privacy protection measures for all case data included the following: anonymization of data prior to collection by removing personally identifiable information (e.g., names, ID numbers); establishment of a tiered access control system restricting complete dataset access to authorized researchers only; and presentation of all clinical data in aggregated form during publication to eliminate the risk of individual information disclosure.

This study was designed as a single-center retrospective comparative analysis. Importantly, the intervention (goal management combined with humanized nursing) was implemented at the ward level as a system-wide change, rather than as an individual patient-level treatment. Therefore, the study design is quasi-experimental in nature. To address this, we explicitly distinguish between: (a) primary patient-level outcomes (hospital stay, pain scores, adverse events, patient satisfaction), and (b) exploratory process measures (nursing competence and care quality scores), which are assessed at the nursing staff and ward levels, respectively, with different units of analysis. All findings are interpreted with appropriate caution regarding causal inference.

This retrospective study was approved by the Institutional Review Board of the China-Japan Union Hospital of Jilin University. The requirement for informed consent was waived by the IRB due to the retrospective nature of the study, which involved the analysis of de-identified patient data, and because the intervention was implemented as a standard of care at the ward level.

2.2 Inclusion and Exclusion Criteria

Patient inclusion criteria required: age ≥ 18 years, undergoing elective or emergency surgical treatment, postoperative hospital stay ≥ 3 days, and complete clinical records. Nursing staff inclusion criteria included:

complete employment records, possession of a valid nursing professional qualification certificate, continuous employment at our hospital for >3 months, and full participation in the research project.

Patient exclusion criteria were: concurrent severe mental illness or cognitive dysfunction, postoperative transfer to an intensive care unit, or inability to complete the full observation period due to transfer to another department, early discharge, or other reasons. Nursing staff exclusion criteria included: <1 year of specialized nursing experience or mid-study withdrawal due to personal reasons such as external training or maternity leave. Data extracted from medical records included, in addition to demographics, the following clinical variables: primary diagnosis and disease category, malignancy status, surgical procedure type (laparoscopic vs. open), operative duration, ASA physical status classification, and major comorbidities (hypertension, diabetes, cardiovascular disease).

Data on the baseline characteristics of nursing staff involved in the two wards were also collected from hospital employment records and are presented in Table S1 as a supplementary analysis to describe the provider-level comparability between the two groups.

2.3 Methods

The control group received conventional nursing management, which comprised routine postoperative care including vital sign monitoring, standard wound care, medication administration per physician orders, and basic discharge education. Nursing staff underwent standard pre-service orientation as per hospital policy. No structured goal-setting or formalized humanistic care protocols were implemented in this group.

The observation group implemented goal management combined with humanized nursing, as detailed below:

To ensure the smooth advancement of goal management, a goal supervision team was first established, with the department head serving as the overall leader, the head nurse as the team leader, and experienced nursing staff with seniority recruited as members. Simultaneously, support from various hospital administrative departments was required to facilitate effective implementation of management across departments. When formulating goals, a summary of the previous year's work was used as a foundation, incorporating factors such as nursing staff's work conditions, personal characteristics, professional qualities, and departmental structure. The SMART principle was applied to scientifically establish group goals aligned with the department's actual circumstances. For individual goals, detailed analysis was conducted based on each nursing staff member's qualifications and work experience, with goals refined into daily, weekly, monthly, quarterly, and annual targets. Specific work objectives were set for

key departmental personnel, while less experienced nurses were assigned outstanding colleagues as learning models. A tiered training and assessment system was implemented accordingly. Effective goal management required clear definition of management content and rational allocation to individuals, reinforcing personal responsibilities while promoting mutual supervision and collective progress among team members. The head nurse established an assessment team to regularly evaluate and supervise nursing work, holding individuals accountable for identified issues and ensuring timely corrections. Regular meetings were organized for nursing staff to analyze care problems, discuss solutions, and improve management practices, thereby enhancing nursing quality. To ensure effective goal management implementation, a comprehensive assessment mechanism covering supervision, summarization, and evaluation was established. During regular meetings, nursing staff conducted self-evaluations and proposed improvement plans. A nursing quality scale was used to comprehensively assess service attitude, operational competence, technical proficiency, and communication skills, with rewards or penalties administered accordingly. Incentive mechanisms were integral to effective goal management, motivating goal attainment and boosting nursing staff enthusiasm.

Humanized nursing emphasized creating a comfortable healthcare environment, which directly impacted patients' mood and recovery. This involved maintaining clean and orderly wards with temperatures kept at 22-25°C and humidity at 50-60%, along with regular disinfection and ventilation. These environmental parameters (temperature 22-25°C, humidity 50-60%) were selected based on institutional infection control guidelines and general nursing standards for postoperative care. Equipment in wards and operating rooms was set to silent mode to ensure quiet rest and quality sleep, with light music played upon patient awakening to promote relaxation. General surgery patients often experienced anxiety and fear, necessitating enhanced psychological care to alleviate these emotions. Nursing staff proactively communicated with patients to understand their psychological states, employing tailored approaches to address mental barriers and adjust attitudes. Maintaining a warm, kind, and considerate demeanor during interactions helped patients feel cared for, reducing tension, anxiety, and fear. Using accessible language, nurses patiently explained disease nature, treatment processes, and success stories to improve patients' understanding of their conditions, enhance treatment compliance, reduce postoperative complications, and foster confidence in recovery. Postoperative analgesia was prescribed by the attending physicians according to a standardized multimodal analgesia protocol for each procedure type. Nursing staff were responsible for pain assessment (NRS) and reporting to physicians for dose adjustments, rather than independently prescribing analgesics. A professional and approachable image was essential for humanized nursing, facilitating patient

acceptance and cooperation. Nursing staff paid attention to appearance, behavior, and communication, demonstrating enthusiasm, thoughtfulness, and kindness to create a familial atmosphere and eliminate alienation. They actively listened to patient feedback to improve care methods, truly centering care on patients and addressing their needs to enhance confidence and satisfaction through high-quality humanized nursing. Humanized nursing required nursing staff to possess not only enthusiasm and solid professional skills but also high comprehensive qualities to provide holistic, high-quality services. Nurses were encouraged to build integrated knowledge systems and participate in hospital-organized training during spare time to stay updated on the latest nursing techniques and clinical knowledge. Mastery of nursing procedures and basic emergency equipment operation was emphasized to continuously improve comprehensive qualities and deliver efficient, high-quality care. Strict institutional management formed the foundation of humanized nursing implementation. Fourteen core nursing systems, including verification and disinfection-isolation protocols, were rigorously enforced to ensure safety for both the nursing team and patients. The head nurse's primary responsibility was to oversee daily nursing safety, beginning with ward rounds to identify patients with potential safety risks and assigning focused care shifts. Environmental inspections involved checking for and resolving damage or hazards, while regular instrument checks ensured prompt maintenance of faults. Newly onboarded nurses' aseptic technique operations were supervised to guarantee standardized and safe practices.

2.4 Observation Indicators

For hospital stay duration, the mean length of stay for patients in both groups was calculated, and intergroup differences were analyzed to evaluate the impact of different nursing models on patients' hospitalization periods.

Nursing competence was assessed using an in-house evaluation system comprising four core dimensions: teamwork ability, communication skills, specialized theoretical knowledge, and specialized operational skills. Each dimension was scored out of 100 points, with the final composite score reflecting overall nursing competence—higher scores indicating stronger capabilities.

Nursing efficacy was evaluated using the NRS, which divides a straight line into 10 equal segments marked with numbers 0-10 (0 representing pain-free status and 10 representing severe pain). Patients marked their pain levels based on personal experience. Assessments were conducted at four fixed time points: 4 hours postoperatively and on postoperative days 1, 2, and 3, all during morning rounds. Continuous evaluations across these four time points provided a comprehensive reflection of pain changes.

The incidence of adverse events was compared between the two nursing models, specifically focusing on nursing

disputes and complaints. Quantitative comparison was performed by calculating the ratio of event occurrences to total nursing interactions.

Nursing quality was evaluated across four dimensions: basic nursing care, documentation quality, patient education, and ward management, each scored out of 100 points. Monthly evaluations were conducted by the departmental nursing quality control team, with the final score for each dimension determined by averaging monthly assessments to reflect stability and continuous improvement in nursing quality.

Patient satisfaction was assessed via questionnaires covering three core dimensions: nursing standardization, basic nursing care, and nursing safety. Strict control was implemented over questionnaire distribution, with patients required to complete surveys carefully and ensure full recovery. Each dimension was scored out of 100 points, with higher scores indicating greater patient satisfaction with nursing services.

2.5 Statistical Analysis

GraphPad Prism 8 was used for image processing in this study. Data were organized and analyzed using SPSS 26.0. Continuous variables were expressed as mean±standard deviation (mean±SD), with intergroup comparisons performed using t-tests. Categorical variables were presented as [n (%)], with intergroup comparisons conducted using chi-square (χ^2) tests. Statistical significance was defined as $P<0.05$.

3 RESULTS

3.1 Baseline Data

The observation group comprised 65 patients (35 males and 30 females), aged 30-47 years (mean±SD: 37.92±2.84 years). Marital status distribution: 19 unmarried, 31 married, and 15 divorced. The control group included 65 patients (32 males and 33 females), aged 30-47 years (mean±SD: 38.17±2.37 years). Marital status distribution: 12 unmarried, 33 married, and 20 divorced. No statistically significant differences in baseline characteristics were observed between the two groups ($P>0.05$), confirming comparability. See [Table 1](#).

A total of 28 nursing staff were involved in this study, with 14 nurses in each group. As shown in [Table 2](#), there were no statistically significant differences between the two groups of nursing staff in terms of age, years of nursing experience, or educational background (all $P>0.05$), indicating that the nursing teams in the two wards were comparable at the provider level.

3.2 Hospital Stay Duration

The mean hospital stay in the observation group (8.17±1.36 days) was significantly shorter than that in the

Table 1. Comparison of Baseline Data Between the Two Groups

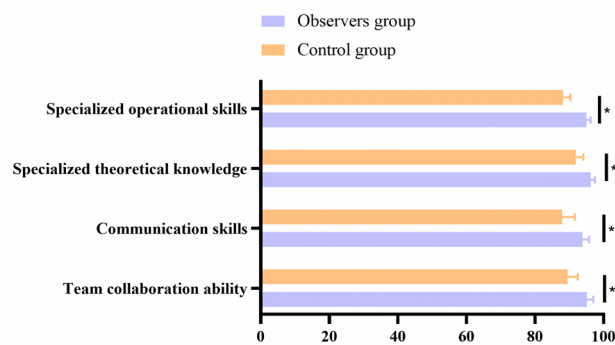
	Observation Group (n=65)	Control Group (n=65)	t/ χ^2	P
Gender				
Male	35	41	-	-
Female	30	41	0.277	0.599
Age (year)	30~47	30~47	-	-
mean $\pm$ SD	37.92 $\pm$ 2.84	38.17 $\pm$ 2.37	0.545	0.587
Marital status				
Unmarried	19	12	-	-
Married	31	33	-	-
Divorced	15	20	2.357	0.307

Table 2. Baseline Characteristics of Nursing Staff

	Observation Group (n=14)	Control Group (n=14)	t/ χ^2	P
Age (years, mean $\pm$ SD)	26.64 $\pm$ 5.57	27.29 $\pm$ 4.61	0.336	>0.05
Years of nursing experience (mean $\pm$ SD)	6.84 $\pm$ 2.57	6.76 $\pm$ 4.51	0.056	>0.05
Education, n (%)	-	-	0.150	>0.05
Bachelor or above	5 (35.7%)	6 (42.9%)		
Associate degree or below	9 (64.3%)	8 (57.1%)		

Table 3. Comparison of Mean Hospital Stay Between the Two Groups

	Observation Group (n=65)	Control Group (n=65)	t	P
Hospitalization time (days)	7-14	8-18	-	-
mean $\pm$ SD	8.17 $\pm$ 1.36	14.18 $\pm$ 2.25	18.430	<0.001


Figure 1. Comparison of Nursing Competence Scores Between the Two Groups. Notes: * indicates statistically significant difference ($P<0.05$).

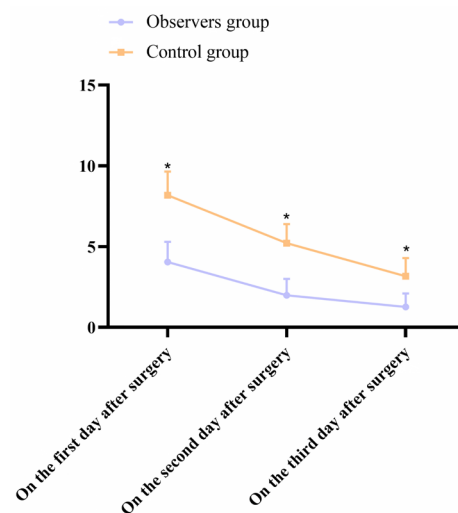
control group (14.18 $\pm$ 2.25 days) ($P<0.05$, Table 3).

3.3 Nursing Competence

Scores for all nursing competence dimensions (teamwork ability, communication skills, specialized theoretical knowledge, and specialized operational skills) were significantly higher in the observation group (95.12 $\pm$ 1.88 / 93.88 $\pm$ 1.89 / 96.23 $\pm$ 1.25 / 95.01 $\pm$ 1.18) compared to the control group (89.54 $\pm$ 2.89 / 87.89 $\pm$ 3.71 / 91.94 $\pm$ 2.11 / 88.25 $\pm$ 2.05) ($P<0.05$) (Figure 1).

3.4 Nursing Efficacy

NRS scores on postoperative days 1, 2, and 3 were


Figure 2. Comparison of Postoperative Pain (NRS) Scores Between the Two Groups. Notes: * indicates statistically significant difference ($P<0.05$).

significantly lower in the observation group (4.05 $\pm$ 1.25 / 1.99 $\pm$ 1.02 / 1.26 $\pm$ 0.84) than in the control group (8.18 $\pm$ 1.47 / 5.22 $\pm$ 1.17 / 3.17 $\pm$ 1.12) ($P<0.05$) (See Figure 2).

3.5 Adverse Events

The total incidence of adverse events (nursing disputes and complaints) was significantly lower in the observation group (2 cases [3.08%], 1 case [1.54%], 3 cases [4.62%]) compared to the control group (11 cases [16.92%], 8 cases

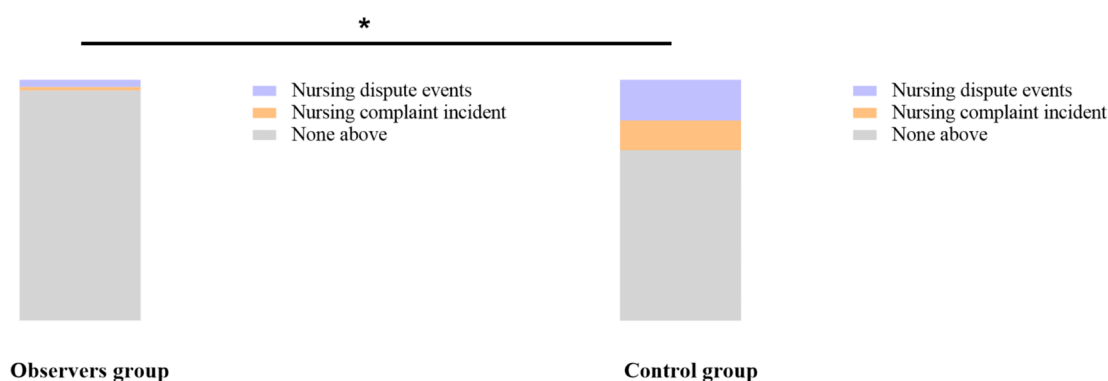


Figure 3. Comparison of Adverse Event Incidence Between the Two Groups. Notes: * indicates statistically significant difference ($P<0.05$).

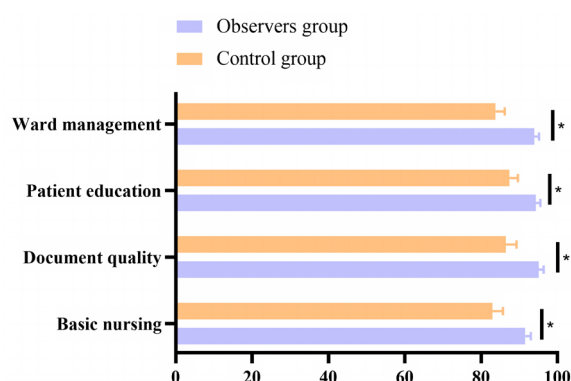


Figure 4. Comparison of Nursing Quality Scores Between the Two Groups. Notes: * indicates statistically significant difference ($P<0.05$).

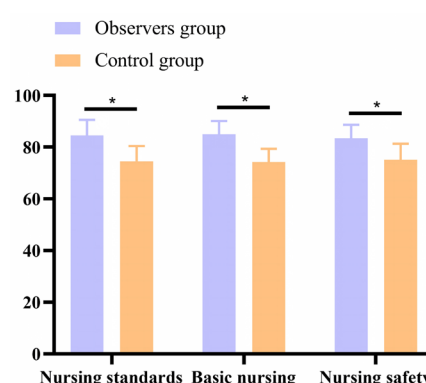


Figure 5. Comparison of Patient Satisfaction Scores Between the Two Groups. Note: * indicates statistically significant difference ($P<0.05$).

[12.31%], 19 cases [29.23%]) ($P<0.05$). See Figure 3.

3.6 Nursing Quality

Scores for all nursing quality dimensions (basic nursing care, documentation quality, patient education, and ward management) were significantly higher in the observation group (91.58 ± 1.47 / 95.11 ± 1.27 / 94.36 ± 1.19 / 93.91 ± 1.26) compared to the control group (82.98 ± 2.74 / 86.44 ± 2.85 / 87.44 ± 2.18 / 83.77 ± 2.41) ($P<0.05$, Figure 4).

3.7 Patient Satisfaction

Scores for all patient satisfaction dimensions (nursing standardization, basic nursing care, and nursing safety) were significantly higher in the observation group (84.56 ± 5.98 / 84.98 ± 5.14 / 83.41 ± 5.22) compared to the control group (74.55 ± 5.87 / 74.22 ± 5.16 / 75.18 ± 6.17) ($P<0.05$, Figure 5).

4 DISCUSSION

As one of the core departments in a hospital, the general surgery department admits patients with complex and diverse conditions, resulting in heavy daily nursing workloads and significant work pressure for nursing staff^[9]. However, traditional management models are overly uniform and fail to adequately consider differences in nurses' cultural backgrounds and work capabilities, leading to homogenized work content for all nurses. This approach not only underutilizes each nurse's professional expertise,

resulting in wasted human resources, but may also adversely affect the improvement of nursing quality, thereby constraining the hospital's sustainable development^[10,11]. Nursing, as a critical component of medical services, plays an irreplaceable role in patient disease treatment and prognosis improvement. By providing high-quality nursing services, it can significantly promote patient recovery, effectively reduce the occurrence of adverse events, and serve as a vital driver for improving overall medical quality while providing a solid foundation for the hospital's sustainable development^[12-15].

Before discussing potential mechanisms, several important design limitations must be acknowledged upfront. First, due to the retrospective and quasi-experimental nature of this study, unmeasured and residual confounding cannot be excluded despite PSM and multivariable adjustment. Second, the absence of blinding for outcome assessors may have introduced measurement bias, particularly for subjective outcomes such as pain scores and patient satisfaction. Third, the large effect sizes observed across multiple domains are atypical for real-world nursing intervention studies, raising the possibility that case mix differences, secular trends, and Hawthorne effects may have contributed substantially to the observed differences. Therefore, all findings should be interpreted as preliminary associations rather than definitive causal effects, and the

following mechanistic discussion is offered as hypothesis-generating rather than confirmatory. Importantly, the baseline characteristics of nursing staff were comparable between the two groups (Table 2), which helps mitigate the concern that observed differences in patient outcomes were merely attributable to variations in nursing team composition or expertise.

This study systematically compared the application effects of objective-based management combined with humanized nursing versus conventional nursing management in general surgery patients. The results demonstrated that the combined intervention model exhibited significant advantages across multiple dimensions. First, the shorter hospital stay observed in the observation group could be potentially associated with the structured task allocation from goal management, combined with enhanced patient comfort and psychological support from humanized care. The observation group refined objectives into daily, weekly, monthly, quarterly, and annual targets, formulated scientific objectives using the SMART principles, and implemented a graded training and assessment system to achieve precise allocation and efficient execution of nursing tasks^[16]. For example, specific work objectives were set for key departmental personnel, while learning benchmarks were designated for less experienced staff, with continuous improvement in nursing efficiency achieved through dynamic assessments and feedback mechanisms. Concurrently, humanized nursing alleviated patient pain and anxiety through environmental optimization (e.g., maintaining a temperature of 22–25°C, silent mode, regular disinfection, and ventilation), psychological support (e.g., proactive communication and anxiety relief), and multimodal analgesia (e.g., dynamic adjustment of drug dosages based on NRS scores), thereby promoting early recovery. The combined effects of these two approaches may have contributed to the shorter average hospital stay in the observation group, suggesting a potential synergistic effect that warrants further investigation^[17,18].

Previous studies suggest that the higher nursing competence scores observed concurrently with improved patient outcomes suggest that the integrated model may have positively influenced staff performance. However, whether this represents a true improvement or reflects assessment bias (e.g., Hawthorne effect) cannot be determined from the current data. The observation group achieved precise enhancement of nursing staff capabilities by setting personal objectives and breaking them down into daily tasks, combined with a graded training and assessment system. For example, teamwork ability was strengthened through regular meetings and mutual supervision mechanisms, communication skills were continuously optimized through psychological nursing practice and patient feedback, and specialized theoretical knowledge and operational skills were iteratively upgraded

through graded training and dynamic assessments. In terms of incentives, both spiritual rewards (e.g., team-building activities to enhance cohesion) and material rewards (e.g., performance-based bonus adjustments) were employed to stimulate nurses' learning motivation and work enthusiasm. Ultimately, all nursing capability scores in the observation group were significantly higher than those in the control group, reflecting the central role of objective-based management in enhancing the professional competence of the nursing team.

The lower postoperative pain scores in the observation group might be associated with the comprehensive pain management approach embedded in the integrated nursing model, which includes regular NRS assessments and timely communication with physicians, alongside the psychological reassurance provided by humanized interactions. The observation group effectively alleviated patient anxiety and fear by proactively communicating with patients, gaining a deep understanding of their psychological states, and explaining disease information in accessible language, thereby lowering the pain perception threshold. Simultaneously, the multimodal analgesia protocol ensured precise and sustained pain management by dynamically adjusting drug dosages based on NRS scores. For example, continuous assessments at 4 hours postoperatively and on postoperative days 1, 2, and 3 enabled dynamic optimization of pain management^[19–21]. The combined effects of these two approaches resulted in significantly lower NRS scores at all postoperative time points in the observation group compared to the control group, highlighting the unique advantages of humanized nursing in pain management.

The mechanism underlying the significant reduction in the incidence of adverse events stems from the assessment and supervision of objective-based management and the communication optimization of humanized nursing. The observation group minimized errors and oversights in nursing processes by establishing an assessment team to regularly monitor nursing work, promptly correct identified issues, and hold regular meetings to analyze problems and improve management. Concurrently, humanized nursing reduced disputes and complaints caused by poor communication by improving nurse-patient communication and enhancing patient trust. For example, nurses maintained a warm and friendly attitude, making patients feel cared for, and improved patient compliance and satisfaction through patient explanations of disease information^[22,23]. Ultimately, the total incidence of adverse events in the observation group was significantly lower than that in the control group, validating the dual protective role of objective-based management and humanized nursing in reducing nursing risks.

Finally, the mechanism underlying the comprehensive

improvement in nursing quality can be elucidated through the systematic assessment of objective-based management and the detail-oriented optimization of humanized nursing. The observation group conducted comprehensive evaluations of service attitude, operational competence, technical proficiency, and communication skills using nursing quality scales, and accordingly administered rewards or penalties, thereby promoting continuous improvement in nursing quality. Concurrently, humanized nursing enhanced various indicators, including basic nursing, documentation quality, patient education, and ward management, through environmental optimization (e.g., clean wards, appropriate temperature and humidity), patient education (e.g., disease knowledge and rehabilitation guidance), and institutional management (e.g., strict adherence to 14 core nursing protocols)^[24-26]. For instance, head nurses identified safety hazards and supervised aseptic procedures through ward rounds, ensuring the safety of nursing processes; they also ensured the proper functioning of equipment by regularly inspecting instruments and promptly arranging repairs. Ultimately, all nursing quality scores in the observation group were significantly higher than those in the control group, reflecting the combined effects of objective-based management and humanized nursing in enhancing nursing quality.

Moreover, the mechanism underlying the significant improvement in patient satisfaction stems from the high-quality services of humanized nursing and the quality assurance provided by objective-based management. The observation group enhanced patient comfort and trust by creating a comfortable healthcare environment (e.g., silent mode, relaxing light music), strengthening psychological care (e.g., alleviating anxiety and fear), and improving the image of nursing staff (e.g., dignified appearance, friendly communication). Concurrently, objective-based management indirectly improved patient satisfaction by enhancing nursing quality and efficiency. For example, nursing staff actively listened to patient suggestions and continuously improved nursing methods, truly adopting a patient-centered approach; they also ensured patient safety and rights by strictly adhering to core nursing protocols. Ultimately, all patient satisfaction scores in the observation group were significantly higher than those in the control group, confirming the synergistic value of humanized nursing and objective-based management in enhancing patient satisfaction^[27,28]. The deep integration of these mechanisms not only demonstrates the innovative value of the nursing model but also provides replicable practical experience for the continuous improvement of clinical nursing quality. Furthermore, although we collected and presented nursing staff baseline data as a supplementary analysis (Table 2), the small number of nurses (n=14 per group) limited our ability to adjust for nurse-level factors in multivariable models. Future studies with larger nursing cohorts are needed to further control for provider-level confounding.

This study was a single-center retrospective analysis. Although PSM was used to balance baseline data, selection bias may still exist, and caution should be exercised in extrapolating the results. The sample size was relatively limited, and future multi-center, large-sample studies are needed to enhance statistical power and the generalizability of conclusions. The follow-up period focused solely on the hospitalization period and did not evaluate long-term nursing outcomes beyond three months postoperatively, such as the incidence of long-term complications and quality of life, indicating insufficient research depth. The nursing competence assessment utilized an in-house evaluation system that, although validated for reliability and validity, may exhibit assessment standard discrepancies across different healthcare institutions, potentially affecting result comparability. Additionally, potential confounding factors, such as patients' social support and economic status, were not fully accounted for. Future studies should improve the control of multidimensional variables to enhance result interpretability.

5 CONCLUSION

In this single-center retrospective quasi-experimental study, an integrated nursing model combining goal management with humanized nursing was associated with shorter hospital stays, lower postoperative pain scores, a lower incidence of adverse events, higher patient satisfaction, and better exploratory process measures in general surgery patients, compared with conventional nursing. However, due to the study's observational design, lack of blinding, and the potential for residual confounding despite PSM, these findings should be interpreted as preliminary and hypothesis-generating. The model demonstrates promise for improving surgical nursing outcomes; however, rigorous, well-designed multicenter randomized controlled trials with blinded outcome assessment and long-term follow-up are essential to establish its causal effectiveness and generalizability.

Acknowledgements

Not applicable.

Ethical Statement

This study was approved by the Institutional Review Board of the China-Japan Union Hospital of Jilin University. The requirement for informed consent was waived by the IRB due to the retrospective nature of the study, which involved the analysis of de-identified patient data, and because the intervention was implemented as a standard of care at the ward level.

Conflicts of Interest

The authors declared no conflict of interest.

Data Availability

All data generated or analyzed during this study are

included in this published article.

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Author Contribution

Yang W conceptualized and designed the study, performed the experiments, analyzed the data, and drafted and revised the manuscript. Lan X developed the methodologies, conducted the statistical analyses, and prepared the figures and supplementary materials. Jia Y assisted with experimental operations, contributed to literature review, provided technical support, and helped with manuscript revision and response to reviewers.

Abbreviation List

NRS, Numeric Rating Scale

PSM, Propensity score matching

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