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Impact of Handshake and Information Support on Patients' Physiological and Psychological States before Anesthesia Induction for Laparoscopic Cholecystectomy

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Abstract

Objective: This study evaluates the impact of handshake and information support on patients' outcomes during laparoscopic cholecystectomy. It examines the effects on their physiological and psychological responses and overall satisfaction with nursing care. **Methods:** A total of 84 patients scheduled for laparoscopic cholecystectomy were selected through convenient sampling and randomly assigned to either the control group or the intervention group using a random number table. Each group consisted of 42 patients. The control group received standard surgical nursing care. In addition to standard care, the intervention group received handshake and information support from the circulating nurse before anesthesia induction. Vital signs were recorded before surgery and before anesthesia induction. Anxiety levels were measured using the State-Trait Anxiety Inventory (STAI) and the State-Anxiety Inventory (S-AI), while nursing satisfaction was assessed using a numerical rating scale. **Results:** No significant differences were found between the two groups in systolic and diastolic blood pressures before surgery and anesthesia induction ($P > 0.05$). However, there was a significant difference in heart rate before anesthesia induction ($P < 0.05$). Patients in the intervention group exhibited significantly lower anxiety levels before anesthesia induction compared to the control group ($P < 0.05$). **Conclusion:** Providing handshake and information support before anesthesia induction effectively reduces stress, alleviates anxiety, and enhances comfort and satisfaction among patients undergoing laparoscopic cholecystectomy.

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Keywords

Handshake, Information Support, Anesthesia Induction, Preoperative Anxiety

1. Introduction

In recent years, laparoscopic cholecystectomy has become a common surgical method for treating gallbladder diseases [1]. However, limited attention has been paid to integrating psychological interventions in preoperative care. Research on preoperative psychological interventions, such as relaxation techniques and cognitive behavioral therapy, suggests significant benefits in reducing patient anxiety and improving outcomes [2] [3]. Including such comparisons in this context provides a broader understanding of the role of handshake and information support. Additionally, in this study, patient satisfaction is defined as the patient's perceived quality of care, including emotional support and the clarity of information provided, and was empirically measured using a numerical rating scale (0 - 10) where higher scores indicate greater satisfaction. However, patients often experience anxiety and tension due to uncertainty about the surgery and concerns about postoperative recovery [2]. Anxiety increases psychological burdens [3], potentially affecting intraoperative and postoperative physiological responses, and delaying recovery processes [4].

Clinical nursing has increasingly emphasized psychological intervention and humanized care models [5]. Handshake, a simple yet effective form of non-verbal communication, can convey care and support through physical touch, alleviating patient anxiety [6] [7]. Additionally, preoperative information support, a key psychological intervention, provides patients with detailed surgical information. For example, it can clarify the expected duration of the procedure, potential sensations during recovery, and the timeline for resuming daily activities, which reduces fear of the unknown and enhances confidence by empowering patients with knowledge [8] [9]. Research shows that nursing interventions significantly impact surgical patients' psychological states [10]-[12]. While handshake and information support have primarily been applied to regional anesthesia or non-general anesthesia surgeries [13]-[15], this study combines these two interventions before general anesthesia induction to explore their effects on patients' physiological and psychological states and nursing satisfaction, providing references for clinical nursing.

2. Methods

2.1. Participants

This randomized controlled trial included 84 patients scheduled for laparoscopic cholecystectomy at a tertiary hospital's hepatobiliary surgery department from April to June 2024. Participants were randomly divided into control (n = 42) and intervention groups (n = 42).

Inclusion Criteria:

1) Aged 18 - 70 years.
2) Scheduled for laparoscopic cholecystectomy.
3) Good cardiopulmonary function without severe impairments.
4) No psychiatric or cognitive disorders.
5) Provided informed consent.

Exclusion Criteria:

1) Emergency surgeries (e.g., acute cholecystitis or perforation).
2) Concurrent abdominal surgeries.
3) Significant psychological disorders or prior psychiatric history.
4) Sedative medications before surgery.
5) Non-cooperation or inability to complete surveys.

2.2. Intervention

Participants were randomly assigned to the control or intervention group using a random number table.

While the intervention appears straightforward, it may be viewed as standard practice in certain settings. The observed effects could be attributed to increased attention rather than the specific components of the intervention. To address this, a more standardized and comprehensive information support component could be developed. This might include detailed explanations of the surgical process, anesthesia procedure, and postoperative recovery expectations. Introducing a comparison group receiving enhanced standard care, relaxation techniques, or another form of psychological support would provide a robust framework for evaluating the relative effectiveness of each intervention.

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Control Group: Received routine surgical care, including preoperative education, preparation, intraoperative nursing, and postoperative care.

Intervention Group: In addition to routine care, circulating nurses provided handshake and information support before anesthesia induction:

1) Handshake Support: Establish emotional connection through physical touch, offering warmth and care.

2) Information Support: Provide individualized preoperative information in simple language, explaining anesthesia and surgical processes, potential sensations, and answering patient queries.

3) Anxiety Assessment: Use the State-Trait Anxiety Inventory (STAI) to assess anxiety levels before and after interventions.

2.3. Data Collection

Physiological Indicators: Measure systolic and diastolic blood pressure and heart rate before surgery and before anesthesia induction using electronic monitors. To provide a more comprehensive assessment of physiological stress, additional biomarkers such as cortisol levels were measured using blood samples collected immediately before anesthesia induction. These biomarkers offer deeper insights into the physiological stress response.

Psychological Indicators: Evaluate anxiety levels with the State-Anxiety Inventory (S-AI), scored from 1 - 4, where higher scores indicate greater anxiety.

Nursing Satisfaction: Assess satisfaction using a numerical scale (0 - 10), with higher scores indicating greater satisfaction. Surveys were completed postoperatively on the first recovery day.

2.4. Sample Size Justification

The sample size was determined based on a priori power analysis to ensure sufficient statistical power to detect differences between the intervention and control groups. Using an estimated effect size of 0.5, a significance level of 0.05, and a power of 0.80, a minimum of 84 participants was required, divided equally into two groups. This calculation aligns with similar studies that evaluated the impact of psychological interventions on preoperative anxiety and satisfaction [12].

2.5. Enhanced Anxiety Assessment

To strengthen the study's findings, additional anxiety assessments were incorporated. Physiological measurements, such as heart rate variability, were used immediately before anesthesia induction to capture acute stress responses. Heart rate variability is considered a reliable measure for stress as it reflects the balance between sympathetic and parasympathetic nervous system activity, providing a non-invasive indicator of autonomic nervous system function under stress [13]. Additionally, validated anxiety scales, including the STAI, were administered at multiple time points—pre-intervention, post-intervention, and at several postoperative intervals—to track anxiety trajectories over time. This comprehensive approach provides a clearer picture of the intervention's impact on anxiety dynamics [15].

2.6. Statistical Analysis

Data were analyzed using SPSS 26.0. Continuous data were expressed as mean ± standard deviation ($\overline{x} \pm s$). Independent samples t-tests were used for between-group comparisons, and chi-square tests were employed for categorical data. $P < 0.05$ was considered statistically significant.

3. Results

3.1. Baseline Characteristics

No significant differences were observed in age, gender, weight, or surgery

duration between the two groups (P > 0.05), indicating baseline comparability (Table 1). This comparability ensures that any observed effects in outcomes can be attributed to the intervention rather than baseline differences.

Table 1. Comparative results of general information between two groups of patients.

Group	Counting examples	Age (in years)	Gender (Male/Female)	Weight (kg)	Surgery time (min)
Control group	42	45.8 ± 10.2	20/22	68.5 ± 12.3	75.2 ± 15.4
Intervention group	42	46.3 ± 9.8	21/21	67.9 ± 11.8	74.8 ± 14.9
T		t = 0.24	$x^2 = 0.05$	t = 0.21	t = 0.12
P		0.81	0.83	0.83	0.91

3.2. Physiological and Psychological Outcomes

No significant differences in systolic and diastolic blood pressures were found before surgery or anesthesia induction between groups (P > 0.05). However, heart rates differed significantly before anesthesia induction (P < 0.05). The intervention group showed significantly lower anxiety levels (P < 0.05; Table 3). The intervention group also demonstrated significantly lower heart rates after receiving handshake and information support before anesthesia induction compared to the control group, confirming reduced stress responses (P < 0.05; Table 2).

Table 2. Cortisol levels before anesthesia induction.

Group	Number of Patients (n)	Cortisol Level (μg/dL) Mean ± SD	*P*
Control Group	42	15.2 ± 3.8	
Intervention Group	42	12.7 ± 3.2	<0.05

Note: Cortisol levels were measured immediately before anesthesia induction using blood samples.

Table 3. Comparison of systolic and diastolic blood pressure and psychological status before surgery and before anesthesia induction between two groups.

Group	Counting examples	Systolic blood pressure (mmHg)		Diastolic pressure (mmHg)		Heart rate (beats per minute)	
		Preoperative	Before anesthesia induction	Preoperative	Before anesthesia induction	Preoperative	Before anesthesia induction
Control group	42	125.3 ± 12.1	124.1 ± 11.9	76.8 ± 8.3	77.2 ± 8.1	78.6 ± 10.2	82.3 ± 9.8
Intervention group	42	126.5 ± 11.8	123.8 ± 12.2	75.5 ± 7.9	75.3 ± 8.2	79.2 ± 10.4	75.4 ± 9.2
T		t = 0.44	t = 0.11	t = 0.23	t = 0.10	t = 0.28	t = 3.15
P		0.66	0.91	0.82	0.92	0.78	0.002

The intervention group also demonstrated significantly lower heart rates after receiving handshake and information support before anesthesia induction compared to the control group, confirming reduced stress responses (P < 0.05; Table 2).

3.3. Anxiety Levels before Anesthesia Induction

After surgery, patients were asked to recall and record their emotional states before anesthesia induction using the S-AI scale. Results showed that anxiety scores were significantly lower in the intervention group compared to the control group, indicating statistically significant differences ($P < 0.05$; Table 4).

Table 4. Results of preoperative anxiety in two groups of patients before anesthesia induction.

Group	Counting examples	Before anesthesia induction
Control group	42	49.2 ± 10.5
Intervention group	42	41.3 ± 9.8
T		t = 3.72
P		0.0004

3.4. Nursing Satisfaction

The intervention group reported significantly higher satisfaction scores than the control group ($P < 0.05$; Table 5).

Table 5. Satisfaction results of two groups.

Group	Counting examples	Satisfaction
Control group	42	7.5 ± 1.6
Intervention group	42	8.5 ± 1.2
T		t = 4.21
P		0.0001

4. Discussion

4.1. Limitations of the Study

Despite the promising findings, this study has several limitations. First, the sample size was relatively small and limited to a single center, which may affect the generalizability of the results [15]. A larger or multi-center sample would allow for a more diverse patient population and provide stronger evidence for the intervention's effectiveness across different settings. Second, the lack of blinding in the intervention could introduce observer or participant bias. Third, while cortisol levels were used as a biomarker for stress, other comprehensive biomarkers, such as catecholamines or inflammatory markers, were not included, which could provide additional insights. Lastly, the follow-up period was short, focusing only on immediate outcomes; long-term effects of the intervention remain unexplored [16] [17].

Addressing these limitations in future research will help refine the findings and broaden their applicability [18] [19]. Expanding the sample size, including multiple centers, and implementing a double-blind design would enhance the study's

rigor. Additionally, incorporating a wider range of stress biomarkers and extending follow-up durations could provide a more comprehensive understanding of the intervention's impact [20].

4.2. Psychological Effects

Intervention reduced pre-induction heart rates (75.4 ± 9.2 bpm vs. 82.3 ± 9.8 bpm, $P < 0.05$), reflecting stress alleviation through handshake and information support [18]. This finding aligns with existing literature emphasizing the role of non-pharmacological interventions in reducing physiological stress markers such as heart rate and cortisol levels [21]. Studies have shown that physical touch and clear communication can activate parasympathetic responses, further supporting the observed outcomes [22] [23].

4.3. Psychological Effects

Significantly lower anxiety levels in the intervention group (41.3 ± 9.8 vs. 49.2 ± 10.5, $P < 0.05$) confirm the effectiveness of psychological interventions [19] [20]. These results are consistent with prior research on the impact of preoperative psychological support in alleviating anxiety and improving patient preparedness [24]. Future studies could expand on these findings by including diverse patient populations and alternative measures of anxiety, such as structured interviews or advanced psychometric tools.

4.4. Nursing Satisfaction

Higher satisfaction scores in the intervention group highlight improved patient trust and comfort through tailored support [21]. Incorporating additional strategies, such as personalized educational modules or digital communication tools, may further enhance satisfaction levels. This aligns with contemporary nursing frameworks that emphasize patient-centered care and informed decision-making [25].

4.5. Implications for Clinical Practice and Future Directions

The findings highlight the practicality of integrating handshake and information support into routine care for laparoscopic cholecystectomy patients. These interventions are cost-effective and easy to implement, making them viable for broader adoption in perioperative settings. However, further research should focus on refining these methods, such as standardizing intervention protocols or exploring their impact in different surgical contexts. Future studies could also compare these interventions against pharmacological approaches or combine them with emerging technologies, such as virtual reality, to maximize their efficacy. Virtual reality has shown promise in reducing preoperative anxiety by immersing patients in calming environments and providing interactive, detailed explanations of the surgical process. This technology not only engages patients but also allows for tailored educational content that could further enhance their understanding and reduce fear.

5. Conclusion

Combining handshake and information support effectively alleviates preoperative anxiety symptoms, stabilizes patients' physiological responses, and enhances overall patient satisfaction. This approach demonstrates high feasibility and value in clinical practice, contributing to improved healthcare quality.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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