



Research Article

A Survey on the Status of Knowledge, Attitude and Practice (KAP) Regarding Terminal Disinfection among Operating Room Nurses

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Abstract

Objective: To investigate the status of knowledge, attitude, and behaviour (KAP) among nursing staff in the operating room of a tertiary hospital in Guangdong Province regarding terminal disinfection, analyse influencing factors, and propose improvement suggestions. **Method:** Convenience sampling was used to select 100 nursing staff in the operating room of the hospital from May to August 2025 as the research subjects. A self-made "Survey and Research Questionnaire on the Knowledge, Beliefs, and Practices of Terminal Disinfection among Operating Room Nursing Staff" was used to understand the nurses' knowledge, beliefs, and behavioural performance, and explore their influencing factors. **Result:** The overall knowledge dimension shows a difference of "partially weak, partially solid"; Nursing staff scored the highest in the behavioural dimension (93.7%), followed by the knowledge dimension (87.5%), and the attitude dimension scored the lowest (78.2%), but all three were above a good level; Logistic regression analysis showed that years of work experience, participation in special infection surgeries, and training on terminal disinfection knowledge for infection surgeries were the main factors affecting the final disinfection of operating room nursing staff ($P < 0.05$). **Conclusion:** The nursing staff in the operating room of this hospital have a good understanding of terminal disinfection, and their work experience, participation in special infection surgeries, and training in terminal disinfection all affect their ability to understand, practice, and practice terminal disinfection. Clinical practice needs to further strengthen the training of operating room nursing staff, carry out targeted training according to domestic standards, take effective measures for the terminal disinfection ability of clinical operating room nursing staff, and optimize work processes; At the same time, effective measures should be actively taken to enhance the awareness of terminal disinfection among operating room nursing staff, improve the quality of clinical terminal disinfection, and reduce the incidence of clinical infections. Ensure that training on terminal disinfection skills for operating room nursing staff is implemented in clinical work, combining theoretical content with clinical practice, effectively improving the knowledge, beliefs, and practical abilities of domestic nursing staff in terminal disinfection, and greatly reducing the risk of hospital infection.

Keywords: Operating room; Nursing staff; Final disinfection; Know; Believe; Act

Introduction

As a key area for hospital infection control, the cleanliness and final disinfection quality of the operating room directly affect the safety of surgical patients and the incidence of hospital infections. Numerous studies have shown that outbreaks of infections related to environmental cleanliness and quality in medical institutions have good cost-effectiveness in reducing patient infection rates [1]. The operating room is one of the high-risk departments for hospital infections. Proper handling of postoperative dressings, instruments, and operating rooms can effectively reduce cross infection [2]. There are studies indicating that effective terminal disinfection and prevention measures can greatly reduce the transmission rate of pathogenic microorganisms in surgical infections [3]. Therefore, enhancing the quality of terminal disinfection has a positive effect on the prevention and control of postoperative infections. Therefore, in order to further control hospital acquired infections, it is essential to carry out terminal disinfection. The main purpose of this study is to investigate the status and influencing factors of knowledge, attitude, and practice of surgical terminal disinfection among operating room nurses. The specific situation is as follows

Data and Methods

Survey Subjects

Using convenience sampling method, a survey was conducted on 100 operating room nursing staff from a tertiary Grade A comprehensive hospital in Guangzhou from May 2025 to August 2025. Inclusion criteria: **1.** Operating room nurse with at least 1 year of work experience in the operating room; **2.** Obtained a clinical nurse practice certificate; **3.** Voluntarily participate in this survey research. Exclusion criteria: **1.** Internship and training nurses; **2.** Due to various reasons, I am unable to cooperate in completing the investigation and research.

Method

General Information Collection

According to a self-designed survey questionnaire, collect the gender, age, education level, professional title, work experience, professional title, whether they have received specialized training in terminal disinfection, and the number of special infection surgeries they have participated in in the past year for all survey respondents.

Investigation on Knowledge, Beliefs and Practices of Terminal Disinfection.

Based on the actual situation of the hospital, a survey questionnaire

titled “Knowledge, Attitude, and Practice Scale for Terminal Disinfection of Operating Room Nursing Staff” was developed. The questionnaire mainly refers to documents such as “Technical Specifications for Disinfection in Medical Institutions”, “Technical Specifications for Hospital Isolation”, “Technical Specifications for Disinfection in Medical Institutions”, and “Scoring Standards for Terminal Disinfection Inspection in Operating Rooms”. The content includes knowledge, attitude, and behaviour (KAP), and the scale consists of three dimensions: knowledge (15 items), attitude (8 items), and behaviour (12 items), with a total of 35 items. Using the Likert 5-point rating system, the higher the score, the better.

Quality Control

Distribute basic information survey forms to operating room nurses and conduct a knowledge, belief, and behaviour survey. Before filling out the survey form, provide a detailed introduction to the content and precautions. After filling out the form, collect it uniformly and proofread the collected survey questionnaire content. A total of 100 questionnaires were distributed in this survey, and 100 were effectively collected, with an effective response rate of 100%.

Statistical Methods

SPSS 24.0 was used for statistical analysis. Quantitative data is represented by ($\bar{x} \pm s$) and subjected to t-test or analysis of variance for statistical analysis. Logistic regression analysis was used to investigate the influencing factors on the knowledge, beliefs, and practices of terminal disinfection among operating room nursing staff. $P < 0.05$ indicates statistical significance of the difference.

Results

Score of Knowledge, Belief and Practice of Terminal Disinfection for Operating room Nursing Staff

This study conducted descriptive statistical analysis on the score status of KAP in various dimensions of the research subjects. The results showed that nursing staff had the highest score rate in the behavioural dimension (93.7%), followed by the knowledge dimension (87.5%), and the attitude dimension had the relatively lowest score rate (78.2%), but all three were above a good level. It is worth noting that there is a significant structural imbalance within the knowledge dimension, with an overall difference of “partially weak and partially solid”. Specifically, practical knowledge modules directly related to clinical operations, such as “Disinfectant Use” (80.0%), “Clean Disinfectants” (81.3%), and “Special Infection Medical Waste Treatment” (82.7%), have a high scoring rate. However, in the basic theoretical knowledge modules such as “Basic Knowledge of Infectious Surgery” (32.3%) and “Classification of infectious diseases” (34.0%), the scoring rate

was significantly lower. This phenomenon suggests that the research subjects may exhibit strong adherence to operational procedures, but there are significant shortcomings in the deep theoretical understanding that supports their behaviour. Although a positive professional attitude (with scores above 82% for each sub item) and highly standardized operating procedures ensure high-level performance at the behavioural level, the lack of basic theoretical knowledge may pose potential risks when dealing with non-standardized or sudden infection control situations. Table 1.

Dimension	Aspect/Total Score	Number of entries	Full Marks	Score (mean $\pm$ standard deviation)	Scoring rate (%)
	Total score of knowledge	15	15	13.12 $\pm$ 1.40	0.875
	Basic knowledge of infection surgery	3	3	0.97 $\pm$ 0.56	0.323
	Classification of infectious diseases	3	3	1.02 $\pm$ 0.53	0.34
	Disinfectant usage	3	3	2.40 $\pm$ 0.74	0.8
Knowledge	Disinfectant Cleaner	3	3	2.44 $\pm$ 0.70	0.813
	Special infectious medical waste	3	3	2.48 $\pm$ 0.72	0.827
Attitude	Attitude Total Score	8	40	31.27 $\pm$ 2.99	0.782
	The Importance of Final Disinfection	3	15	12.77 $\pm$ 1.17	0.851
	Attitude towards final disinfection				
	Significance of departmental intervention	3	15	12.42 $\pm$ 1.07	0.828
Behavior	Total score of behavior	12	60	56.22 $\pm$ 3.49	0.937
	Disinfectant preparation	6	30	28.83 $\pm$ 1.44	0.961
	Cleaning and disinfection operations	6	30	27.62 $\pm$ 1.79	0.921

Table 1: Descriptive Statistical Analysis of the Status of Knowledge, Beliefs, and Practices of Terminal Disinfection among Operating Room Nursing Staff.

Single Factor Analysis of Final Disinfection of Operating Room Nursing Staff

The single factor analysis of this study aims to preliminarily screen for relevant factors that may affect the final disinfection KAP level of operating room nursing staff. The analysis clearly reveals that variables related to postnatal career development, rather than demographic characteristics, are the main reasons for the differences in KAP levels. The results showed that there was no statistically significant difference ($P > 0.05$) in the scores of KAP dimensions for variables such as gender, professional title, and education level. In contrast, the variables of receiving specialized training, participating in special infection surgeries in the past year, and years of work experience showed significant positive effects on all dimensions of KAP ($P < 0.05$). Specifically, nursing staff who received specialized training had significantly higher average scores in knowledge, attitude, and behaviour compared to non-recipients ($P < 0.001$), confirming the fundamental role of systematic education. The cumulative effect of practical experience is also significant.

Nurses who participate in special infection surgeries ≥ 7 times have significantly better knowledge and behavior scores than those who participate less frequently ($P \leq 0.001$), highlighting the key value of high-frequency practice in knowledge consolidation and skill transformation. In addition, as a reflection of long-term experience, the influence of work experience shows a trend of increasing with

age ($P < 0.05$), indicating the long-term internalization effect of professional experience. In summary, the results of the univariate analysis indicate that establishing a theoretical foundation through systematic training, consolidating it through high-frequency clinical practice, and continuously internalizing it in long-term careers are the core paths to enhance the professional competence of nursing staff in terminal disinfection. Please refer to Table 2 for details.

Factor	Classification	Number of cases (N)	Knowledge score (mean $\pm$ standard deviation)	Attitude score (mean $\pm$ standard deviation)	Behavioral score (mean $\pm$ standard deviation)
Age	20-29 years old	41	13.17 $\pm$ 1.22	31.83 $\pm$ 2.97	55.37 $\pm$ 3.94
	30-39years old	28	12.86 $\pm$ 1.46	29.96 $\pm$ 2.55	56.61 $\pm$ 3.37
	40-49years old	24	13.25 $\pm$ 1.65	31.46 $\pm$ 3.27	57.00 $\pm$ 2.84
	50years old and above	7	13.43 $\pm$ 1.40	32.57 $\pm$ 2.57	57.00 $\pm$ 2.52
	F value		0.52	2.886	1.471
	P value		0.669	0.040*	0.227
Gender	female	90	13.10 $\pm$ 1.42	31.23 $\pm$ 3.04	56.38 $\pm$ 3.48
	male	10	13.30 $\pm$ 1.25	31.60 $\pm$ 2.68	54.80 $\pm$ 3.46
	T value		-0.426	-0.366	1.362
	P value		0.671	0.715	0.176
Years of Work	1-5years	53	12.83 $\pm$ 1.28	30.34 $\pm$ 2.76	55.43 $\pm$ 3.45
	6-10years	31	13.29 $\pm$ 1.51	32.19 $\pm$ 2.50	56.35 $\pm$ 3.44
Experience	11-20years and above	16	13.75 $\pm$ 1.39	32.56 $\pm$ 3.69	58.56 $\pm$ 2.71
	F value		3.104	6.107	5.418
	P value		0.049*	0.003*	0.006*
Professional Title	nurse	18	13.22 $\pm$ 1.56	31.83 $\pm$ 2.50	56.33 $\pm$ 3.52
	nurse practitioner	48	13.06 $\pm$ 1.48	31.33 $\pm$ 3.35	56.21 $\pm$ 3.70
	Supervisor Nurse				
	Deputy Chief Nurse or above	30	13.07 $\pm$ 1.23	30.97 $\pm$ 2.77	56.30 $\pm$ 3.37
		4	13.75 $\pm$ 1.26	30.25 $\pm$ 2.22	55.25 $\pm$ 2.63
	F value		0.336	0.47	0.112
	P value		0.8	0.704	0.953
Academic	Associate degree or below	9	13.89 $\pm$ 1.05	31.67 $\pm$ 3.16	55.78 $\pm$ 3.11
Qualification	undergraduate	87	13.09 $\pm$ 1.40	31.24 $\pm$ 3.01	56.29 $\pm$ 3.46

	Master's degree or above	4	12.00 ± 1.41	31.00 ± 2.94	55.75 ± 5.68
	F value		2.741	0.098	0.123
	P value		0.07	0.907	0.885
Have you Received Specialized Training	yes	58	13.59 ± 1.20	32.33 ± 2.69	57.52 ± 2.47
	No	42	12.48 ± 1.42	29.81 ± 2.80	54.43 ± 3.91
	T value		4.228	4.55	4.839
	P value		<0.001*	<0.001*	<0.001*
Participated in Special Infection Surgeries in the Past Year	0 times	5	10.80 ± 0.84	26.60 ± 1.14	52.80 ± 3.63
	1-3 times	15	12.53 ± 1.46	29.87 ± 3.00	54.47 ± 3.74
	4-6 times	30	13.17 ± 1.32	30.97 ± 2.53	55.67 ± 3.33
	7 times or more	50	13.50 ± 1.22	32.34 ± 2.75	57.42 ± 3.03
	F value		8.115	9.249	5.832
	P value		<0.001*	<0.001*	0.001*
Degree of emphasis on final disinfection	Very unimportant	24	12.75 ± 1.36	31.13 ± 2.49	56.88 ± 3.06
	neglect	17	12.88 ± 1.65	31.06 ± 3.17	56.29 ± 2.85
	average	19	13.58 ± 1.31	31.84 ± 2.57	55.37 ± 3.83
	value	16	13.25 ± 1.18	32.06 ± 3.49	55.88 ± 3.52
	attach great importance to	24	13.21 ± 1.44	30.58 ± 3.31	56.42 ± 4.09
	F value		1.112	0.8	0.544
	P value		0.355	0.528	0.704

Table 2: Single Factor Analysis of Factors Influencing Knowledge Attitude Behaviour Scores.

Logistic Regression Analysis of Final Disinfection of Operating Room Nursing Staff

To further explore the independent influencing factors on the final disinfection KAP level of operating room nursing staff, this study divided them into high and low scores of knowledge, attitude, and behaviour as dependent variables, and included variables with statistical significance in univariate analysis into a multivariate logistic regression model. The regression analysis identified that years of work experience, whether or not they received specialized training, and the number of times they participated in special infection surgeries were common and independent predictive factors affecting the three dimensions of KAP (all $P < 0.05$). Among them, the effect of specialized training is particularly significant, with the odds ratio (OR) of knowledge scores in the high group of trainees being 6.56 times higher than that of non-trainees (95% CI: 2.140-20.079). Similarly, the increase in work experience and number of surgeries significantly increased the probability of KAP scores entering the high group. This discovery provides clear evidence-based support for managers: the key to improving the professional level of terminal disinfection for nursing staff lies in implementing systematic training and providing sufficient clinical practice opportunities Table 3 for details.

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Dimension	Variable	B	S.E.	Wald χ^2	P value	OR (Exp(B))	95% C.I. for OR
Knowledge	Years of Work Experience	1.524	0.41	13.829	<0.001*	4.59	2.056-10.246
	Receive specialized training	1.88	0.571	10.837	0.001*	6.555	2.140-20.079
	Number of	0.993	0.344	8.334	0.004*	2.698	1.375-5.294
	surgeries						
Attitude	Years of Work Experience	1.348	0.416	10.483	0.001*	3.848	1.702-8.701
	Receive specialized training	1.7	0.551	9.526	0.002*	5.472	1.860-16.103
	Number of	1.578	0.384	16.86	<0.001*	4.845	2.281-10.289
	surgeries						
Behavior	Years of Work Experience	1.631	0.421	15.036	<0.001*	5.108	2.240-11.649
	Receive specialized training	1.719	0.575	8.951	0.003*	5.581	1.809-17.212
	Number of	1.176	0.363	10.478	0.001*	3.243	1.591-6.610
	surgeries						

Table 3: Multivariate Logistic Regression Analysis of Nurses' Knowledge Attitude Behaviour in Terminal Disinfection.

Discussions

Current Situation of Terminal Disinfection in Operating Room Nursing

The level of knowledge, belief, and practice of terminal disinfection among operating room nurses is an important indicator that affects the quality of terminal disinfection during surgery. Improving their awareness of terminal disinfection during surgery can effectively prevent infections in the operating room [4-6]. According to this study, the overall knowledge dimension presents a difference of “partially weak and partially solid”; Nursing staff scored the highest in the behavioural dimension (93.7%), followed by the knowledge dimension (87.5%), and the attitude dimension scored the lowest (78.2%), but all three were above a good level; Logistic regression analysis showed that years of work experience, participation in special infection surgeries, and training on terminal disinfection knowledge for infection surgeries were the main factors affecting the final disinfection of operating room nursing staff ($P < 0.05$), which is similar to previous literature [5-9].

Related studies have shown that work experience is positively correlated with the knowledge level of nursing staff, and the longer the work experience, the richer the relevant knowledge reserves. Upon investigation, with the increase of working years, nursing staff have become more experienced in clinical practice, able to gain true knowledge from practice, and theoretical knowledge is applied and consolidated in practical work, resulting in a higher level of knowledge

Factors Affecting Final Disinfection of Operating Room Nursing

The results of this study showed that the influencing factors of the knowledge, beliefs, and practices of terminal disinfection among operating room nurses with surgical infections mainly include work experience, the number of special infection surgeries they have participated in in the past year, and the training they have received in terminal disinfection. The reasons for this include: □ With the increase of nursing staff's working hours, their clinical practice experience becomes more abundant, so they can summarize their experience in practice and better integrate theoretical knowledge into practical work; With the increase of professional titles and educational levels, nursing staff's relevant knowledge reserves and skill operations have been improved, and their ability to summarize clinical work has also increased [9].

Therefore, by summarizing relevant knowledge and methods, they can improve their own quality and promote the improvement of terminal disinfection knowledge and ability. □ Nursing staff regularly receive knowledge training, which enables them to master various professional knowledge such as theoretical knowledge,

ideological awareness, and operational skills, and apply them to clinical practice to strengthen their belief in performing terminal disinfection, standardize their terminal disinfection behaviour, and meet clinical needs; □ Nursing staff should apply the management requirements, cleaning and disinfection principles, and guidelines for strengthening cleaning and disinfection in accordance with the “Standards” to guide the final disinfection of clinical postoperative environments, which can better prevent hospital infections [10]. Simultaneously conducting regular evaluations can promptly identify behavioural deficiencies, enhance the standardization of nursing staff behaviour, and help to do a good job in hospital infection control. In response to the above influencing factors, effective measures should be actively taken in clinical practice to enhance the awareness of surgical terminal disinfection among operating room nursing staff and reduce the infection rate.

The specific measures are as follows □ Increase the frequency of special training on terminal disinfection for contaminated surgeries, and continuously update the theoretical knowledge reserve of nursing staff. Strengthen operating room nurses' mastery of terminal disinfection knowledge and their clinical practical operation capabilities to ensure that their skills are aligned with relevant standards. Departments need to clarify the core importance of terminal disinfection work, and ensure the implementation of disinfection procedures through regular inspection and assessment mechanisms.

In summary, work experience, number of special infection surgeries performed in the past year, and training in terminal disinfection are influencing factors on the knowledge, beliefs, and practices of terminal disinfection for operating room nurses undergoing infection surgeries. Taking measures to address these influencing factors can improve the quality of terminal disinfection.

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