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ORIGINAL RESEARCH

A Cross-Sectional Descriptive Study on the Attitudes Towards Patient Safety and Influencing Factors of Nurses in Infectious Diseases Wards

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Background: Patient safety is an important aspect of healthcare delivery and is critical to healthcare quality. An assessment of the attitudes of nursing staff in infectious diseases wards towards patient safety may identify deficiencies and allow for the development of educational programmes to train nursing staff to participate in good patient safety practices.

Objective: To explore the current situation and influencing factors on nurses' attitudes towards patient safety in infectious diseases wards.

Methods: This cross-sectional study enrolled 446 nurses from infectious diseases wards in eight hospitals in the Hebei Province to participate in an electronic questionnaire survey from October to December 2020. The Chinese version of the safety attitude questionnaire was used to gather the opinions of these participants, and SPSS 22.0 statistical software was used to analyse the data.

Results: The average score of safety attitudes towards patients was 3.59 ± 0.30. The scores for each dimension, from high to low, were as follows: management perception: 3.77 ± 0.42 points, pressure perception: 3.77 ± 0.42 points, safety atmosphere: 3.57 ± 0.43 points, job satisfaction: 3.57 ± 0.43 points, teamwork: 3.55 ± 0.50 points and working conditions: 3.50 ± 0.45 points. The results of the multiple stepwise regression analysis showed that the influential factors on nurses' attitudes towards patient safety in infectious diseases wards were as follows: night shift working (β = 11.885, P = 0.000), years of nursing experience (β = 2.862, P = 0.001), education level (β = 4.462, P = 0.001) and marital status (β = 3.871, P = 1.002), which together explained 33.5% of the total variance.

Conclusion: Nurses' attitudes towards patient safety in infectious diseases wards were moderately high. Night shift work, years of nursing experience, education level and marital status affected nurses' attitudes towards patient safety. Managers should focus on these groups of nurses and improve their working conditions and job satisfaction to further enhance patient safety.

Keywords: infectious diseases wards, the nurse, patient safety attitude, influencing factors

Introduction

Patient safety is the avoidance or prevention of injuries or adverse events arising from healthcare and is considered a core element of healthcare organisations.[1] It is defined as a risk control process that reduces unnecessary healthcare-related injuries (ie medical accidents or preventable injuries) to an acceptable minimum.[2,3] Its purpose is to prevent and reduce the risks, errors and injuries that affect patients during the provision of healthcare.[4] A previous study estimated that about 10% of patients worldwide would be injured while receiving medical care every year, mainly due to adverse events.[5] Patient safety is an important part of the quality of medical care.[6] A positive patient safety culture is associated with higher hospital safety-related performance. An increasing number of reports suggest that a better safety culture in healthcare settings contributes to lower adverse event rates and improved patient outcomes.[7–9]

Patient safety is an important medical issue.[10] Due to the nature of nurses' work, nurses play an important role in ensuring patient safety. The research has found that it is necessary to conduct education and training on patient safety to

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solve the problem of nurses' weak patient safety attitudes, although more than half of nurses have a good understanding and a positive attitude towards patient safety.[11] Research by Ree and Wiig shows that open communication is important for establishing a good patient safety culture.[11] Dinius et al[12] showed that high levels of interprofessional teamwork were associated with better patient safety. Furthermore, the attitude of doctors and nurses towards patient safety is an important factor affecting both hospital safety culture and the rate of medical errors.[13] Previous research has shown that nurses' and doctors' positive attitude towards patient safety is related to a lower medical error rate.[14] In a complex clinical environment, nursing students may lack the skills and knowledge to improve patient safety and are prone to errors, which has a negative effect on patients and nursing students. The current challenge in nursing education is to equip nurses with the basic knowledge, skills and attitudes to improve patient safety. Therefore, understanding the status of nurses' attitudes towards patient safety helps evaluate its inadequacies and improvement needs.[8]

The safety attitude questionnaire (SAQ) is one of the most frequently used tools for measuring the safety culture in medical environments.[15] However, the patient safety culture in China started late, and the evaluation tools used are still limited. The research population is mainly focused on nurses in a medical institution and a particular type of department, and the sample population is small. As the front line of infectious disease prevention and control, the patient safety management of infectious diseases units has become the top priority of hospital patient management. However, there are few studies on the attitude towards patient safety in infectious diseases units. This study aims to use the SAQ to explore the current state of nurses' safety attitudes in infectious diseases departments and their influencing factors to identify ways to improve hospital patient safety culture.

Materials and Methods

Research Procedures

This was a cross-sectional survey study. The article is presented in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology statement. From October to December 2020, a stratified sampling method was used to select a total of 446 nurses from infectious diseases wards in eight hospitals in Hebei Province to participate in an electronic questionnaire survey. The authors randomly selected the eight hospitals in the area and questioned the nurses who met the inclusion criteria in the institution. This study was approved by the Medical Ethics Committee of Affiliated Hospital of Hebei University Hospital (Approval No. 2019–01). All subjects gave written informed consent in accordance with the Declaration of Helsinki. All participation was voluntary, and the survey subjects were assured of confidentiality and anonymity.

Inclusion criteria: ① On-The-job registered nurse, ② working in an infectious diseases ward for ≥1 year, ③ working in an infectious diseases ward during the investigation and ④ providing informed consent. Exclusion criteria: ① Further students or interns and ② nurses who go out to study.

Research Instruments

Data Collection Tools

General Information Questionnaire

The questionnaire included the hospital's features as well as the nurses' gender, age, years of nursing experience, marital status, night shift status, job title, position, education level and authorised strength.

The Chinese Version of the Safety Attitude Questionnaire

This study used the Chinese version of the SAQ revised by Guo Xia,[16] which contains six dimensions (teamwork, management perception, safety atmosphere, job satisfaction, working conditions and pressure perception), with a total of 31 items. Each item used a 5-point Likert scale scoring method, and each statement had five types of responses: "strongly agree", "agree", "not necessarily", "disagree" and "strongly disagree", scoring 1–5 points, respectively. The cumulative score of each item was the total score of each dimension and ranged from 31 to 155 points: the higher the score, the more positive the safety attitude. Positive scoring was used in the dimensions of teamwork, management perception, safety atmosphere, job satisfaction and working conditions. The higher the score, the better the respondent's attitude towards patient safety. Pressure perception was a reverse score; the lower the score, the better the respondent's safety attitude. The

content validity of the questionnaire was determined to be 1, the Cronbach's coefficients for all variables in the questionnaire were 0.849–0.880, and the overall Cronbach's alpha coefficient of the questionnaire was 0.864, which indicated good reliability.

Data Collection Methods

Through the Questionnaire Star app, a link to the questionnaire was sent to the nursing departments of the eight hospitals. Unified instructions were provided to enable the survey participants to understand the questionnaire and complete it anonymously. To prevent a nurse from filling in the questionnaire multiple times, there was a unified organisation time for each unit, and all nurses who participated in the survey took part in this. The nursing departments sent the link to those nurses who met the inclusion criteria. After filling out the questionnaire, the results were sent directly to the investigator. In this study, 480 questionnaires were completed; however, some were incomplete, and some were not completed as required. After excluding the invalid questionnaires, of those remaining, 446 were valid, with an effective recovery rate of 92.9%. Two research assistants in the research department collected and checked the information. The data collected was inspected and analysed by a third research assistant. All members of this study and the medical team were blinded to the participants' personal information to reduce selection bias.

Statistical Analysis

As this is a cross-sectional descriptive study, no formal sample size calculation was required or performed. SPSS 22.0 statistical software was used to analyse the data. Measurement data were described as mean ± standard deviation, and count data were described as number and percentage. Comparisons between the two groups were performed using the *t*-test, and comparisons between multiple groups were performed using analyses of variance. The influencing factors were described by multiple stepwise regression. A value of $P < 0.05$ indicated that the difference was statistically significant.

Results

General Information of the Nurses (Table 1)

A total of 446 nurses were investigated in this study, among which 408 were female, and 38 were male. Three hundred ninety were married, and 56 were unmarried. Nurses aged 26–35 formed the largest group, with 274 nurses total. Table 1 shows the specific general information of the nurses.

Scores of Nurses' Attitudes Towards Patient Safety in Infectious Diseases Wards (Table 2)

The total score of nurses' safety attitude towards patients was 111.28 ± 14.38 points, and the average score was 3.59 ± 0.30 points. The scores for each dimension, from high to low, were as follows: management perception: 3.77 ± 0.42 points; pressure perception: 3.77 ± 0.42 points; safety atmosphere: 3.57 ± 0.43 points; job satisfaction: 3.57 ± 0.43 points; teamwork: 3.55 ± 0.50 points; and working conditions: 3.50 ± 0.45 points. The lowest score was for working conditions, and the highest was for management perception.

Comparison of the Scores of Attitudes Towards Patient Safety of Nurses with Different Characteristics (Table 3)

This study used general patient data as the grouping variable to compare the safety attitudes of nurses with different characteristics. The results showed no significant difference in patient safety attitude scores between nurses of different hospitals with varying attributes and genders ($P > 0.5$), indicating less variability among the various sampled hospitals. There was a statistically significant difference in the safety attitude scores of nursing staff of different ages, marital status, years of nursing experience, night shift status, title, position, education level and authorised strength ($P < 0.05$). Of all the participants, nurses younger than 25 scored higher on patient safety attitudes than nurses in other age groups. Unmarried nurses scored higher than married nurses, and nurses with 2–5 years of nursing experience scored higher than the others (all $P < 0.05$). The nurses with an undergraduate or a postgraduate education, staffing government-affiliated

Table 1 General Information of Nurses

Items	Number of People (n)	Percentage (%)
Hospital attributes		
General hospital	190	42.6
Specialist hospital	256	57.4
Gender		
Female	408	91.5
Male	38	8.5
Marital status		
Married	390	87.4
Unmarried	56	12.6
Age(years)		
<25	72	16.1
26~35	274	61.4
36~45	79	17.7
>46	21	4.7
Working years (years)		
1	40	8.9
2~5	126	28.3
6~10	137	30.8
11~15	62	13.9
16~20	41	9.2
≥21	40	8.9
Night shift		
Have	340	76.2
None	106	23.8
Job title		
Nurse	97	21.9
Senior nurse	184	41.3
Nurse in charge	131	29.4
Deputy chief nurse and above	34	7.6
Job duty		
Nurse	395	88.6
Head nurse/deputy head nurse	39	8.7
Deputy director of nursing department and above	12	2.7
Highest education		
Technical secondary school	2	0.4
College	95	21.3
Undergraduate	346	77.6
Postgraduate	3	0.7
Authorized strength		
Career editor	122	27.4
Contract system	324	72.6

institutions and a professional title of deputy director or above scored more than 120 points on patient safety and attitudes and performed better than the nurses with other characteristics. Furthermore, nurses without night shift rotation showed higher scores on patient safety attitudes (all $P < 0.05$).

Multiple Stepwise Regression Analysis of Influencing Factors on the Attitudes Towards Patient Safety of Nurses in Infectious Diseases Wards

The statistically significant items in the univariate analysis were used as independent variables, and the total score of attitudes towards patient safety was used as the dependent variable for the multiple stepwise regression analysis. Finally,

Table 2 Scores and Rankings of Various Dimensions of Safety Attitudes (Points, $\bar{X} \pm S$)

Dimensions	Total Score	Average Score	Sort
Management perception	15.08±4.26	3.77±0.42	1
Pressure perception	14.57±4.44	3.64±0.48	2
Safety atmosphere	24.95±4.23	3.57±0.43	3
Job Satisfaction	17.82±3.21	3.56±0.47	4
Teamwork	21.31±4.03	3.55±0.50	5
Working conditions	17.49±2.97	3.50±0.45	6

Table 3 Comparison of Safety Attitude Scores of Nursing Staff with Different Characteristics (n=446)

Item	Safety Attitude Score	t/F	*P* value
Hospital attributes			
General hospital	111.87	−0.163	0.543
Specialist hospital	110.09	−0.297	0.264
Gender			
Female	112.52	−0.654	0.183
Male	110.88	−0.263	0.298
Age			
<25	120.56	16.357	0.004**
26~35	112.56	12.436	0.064
36~45	114.28	11.368	0.052
>46	119.20	14.643	0.037
Marital status			
Married	105.73	−6.433	0.093
Unmarried	120.88	−7.353	0.016**
Working years (years)			
1	99.14	11.253	0.069
2~5	113.15	9.375	0.005**
6~10	100.77	10.578	0.275
11~15	100.19	10.789	0.279
16~20	115.70	7.759	0.193
≥21	117.04	9.986	0.092
Night shift			
Yes	184.60	−7.164	0.201
No	193.65	−8.365	0.000*
Job title			
Nurse	116.44	7.495	0.012*
Senior nurse	98.87	5.745	0.766
Nurse in charge	96.08	10.364	0.546
Deputy chief nurse	111.14	7.988	0.468
Chief nurse	118.27	9.621	0.006**
Job title			
Nurse	98.10	8.162	0.167
Head nurse/deputy head nurse	116.90	5.657	0.002**
Deputy director of nursing department and above	123.25	8.644	0.094
Other (backbone, responsibility, etc.)	100.13	6.875	0.336
Highest education			

(*Continued*)

Table 3 (Continued).

Item	Safety Attitude Score	t/F	*P* value
Technical secondary school	90.71	4.273	0.133
Junior college	110.80	4.083	0.073
Undergraduate	124.66	8.457	0.068
Postgraduate	128.33	16.798	0.000**
Authorized strength			
Staffing of government affiliated institutions	120.39	−12.117	0.000**
Contract system	96.33	−8.537	0.094

Note: *P<0.05 **P<0.01.

Table 4 Multiple Stepwise Regression Analysis of Factors Affecting Nurses' Safety Attitudes in Infection Wards (n=446)

Variable	Regression Coefficient	Standardized Regression Coefficient	t value	*P* value
Constant	178.692		17.127	0.000
Night shift	11.885	0.152	6.198	0.000
Working years	−2.862	−0.119	−2.589	0.001
Highest education	4.462	0.060	2.492	0.001
Marital status	3.871	−0.064	−2.589	0.002

Note: R^2=0.335 F=41.777 P<0.001.

the factors that entered the regression equation were as follows: night shift work (β = 11.885, P = 0.000), years of nursing experience (β = 2.862, P = 0.001), education level (β = 4.462, P = 0.001), and marital status (β = 3.871, P = 1.002); together, these explain 33.5% of the total variance, indicating that night shift status, years of nursing experience, education levels, and marital status of the nursing staff in infectious diseases wards are factors affecting attitudes towards patient safety (Table 4).

Discussion

Key Findings

The present study is one of the few studies on nurses' attitudes towards patient safety in infectious diseases wards of different hospitals in China based on a standardised SAQ. By investigating nurses' attitudes towards patient safety in eight hospitals, this study showed that the evaluation scores of nurses' attitudes towards patient safety in infectious diseases wards were above average, indicating that nurses' attitudes towards patient safety were relatively positive, although there was still a need for improvement. The factors influencing the safety attitude of nurses in the infectious diseases wards were night shift work, years of nursing experience, education level and marital status.

Theoretical Implications

The Status of Nurses' Attitudes Towards Patient Safety in Infectious Diseases Wards

The six dimensions of scores (from high to low) were management perception, pressure perception, safety atmosphere, job satisfaction, teamwork and working conditions. Among them, the management perception score was the highest, which is consistent with the results of related domestic research.[17] When analysing the reasons, there is no small matter in infection work. Whether it is the infection department in a general hospital or an infectious diseases hospital, there will be a complete infectious diseases ward work system, a relatively sound quality control system and an optimised work

process. The head nurse plays an important role. The management role of the nursing staff is relatively high, so the hospital's safety culture is more comprehensively guaranteed.

In the six dimensions, the scores for working conditions were the lowest. Sun's research also found that the working conditions scores were low,[18] suggesting that the respondents generally felt that working conditions were not good. The nurses in an infectious diseases ward are a unique group of nurses in a hospital; the patients they face daily are infectious. At the same time, just as there is social prejudice against patients with infectious diseases, the social value of nursing staff in infectious diseases wards is also low. As such, the social contribution of the nursing staff in these wards is not properly regarded, resulting in different degrees of discrimination against nursing staff in infectious diseases wards.[19]

Analysis of Influencing Factors on Nurses' Attitudes Towards Patient Safety in Infectious Diseases Wards

Night Shifts

Reasonably arranging the night shifts of nursing staff in an infectious diseases ward will help strengthen their attitudes towards patient safety. This study's results showed that the patient safety attitudes of nurses who did not work night shifts were significantly better than those who did. Studies have shown that irregular and frequent night shifts cause circadian rhythm dysfunction in nurses and affect their health.[20,21] Once a nurse's health is affected, their work quality is easily impacted, posing a threat to patient safety.[22,23]

Years of Nursing Experience

The number of years worked affects nurses' attitudes towards patient safety, and the incidence of adverse events is highest among nurses with a low number of working years.[24,25] This survey's results indicated that nurses who had worked for 2–5 years scored higher on attitudes towards patient safety than nurses who had worked for 1 year (ie the lowest score on attitudes towards patient safety) and those who had worked for 6–15 years (the scores for 6–10 and 11–15 years were similar). This indicates that nurses with more years on the job have a better perception of the negative effects of stress on patient safety. These results are similar to those obtained by Aljadhey et al.[26] However, this is different from other research results. Research shows that nurses with work experience >13 years are more likely to have a positive attitude towards patient safety than nurses with work experience ≤13 years. The older the age and the longer the working years, the more positive nurses' safety attitudes were within the same hospital. This phenomenon arises because age and experience lead to increasing knowledge and skills, higher career positions and a sense of belonging, which contributes to positive patient safety outcomes.[27] Compared with 11–15 and 6–10 years of experience, nurses who have worked for 2–5 years are newcomers to the workplace. Most of them have no marital relationship or children and have less pressure from all aspects of life. Therefore, they are more motivated to work. They are more willing to place work as the focus of their lives, put patient safety first and use their spare time to improve their professional capabilities. Nurses who have worked for only 1 year lack professional skills and work experience, so they score the lowest.[6] However, nurses who have worked for 16–20 years and ≥21 years have considerable clinical experience and a solid theoretical basis, which is evident in their positive attitude towards patient safety. These results suggest that nursing staff in an infectious diseases ward should learn more actively and improve their professional skills to enhance the safety culture of the ward.

Highest Degree

Education affects nurses' attitudes towards patient safety. Research by Yuan et al[28] and Xu et al[29] found that nurses with higher educational qualifications had better attitudes towards patient safety. This may be because highly educated nurses acquire more senior positions and, in turn, are more likely to reject the management system.[30] Indeed, the present study's results revealed that the nurses' attitudes in the infectious diseases wards towards patient safety increased with their level of education. Nurses with higher educational qualifications have a better theoretical understanding and more experience in technical operations than nurses with lower academic qualifications. In addition, nurses with higher educational qualifications (ie at the undergraduate and graduate levels) accumulate more scientific research work experience during their education and have relatively more opportunities for training and further study. Therefore, the attitudes towards

patient safety of nurses with higher education levels are better than those of nurses with lower education levels. The attitude of nurses with only technical secondary school education towards patient safety is relatively poor, and these results are similar to those of another domestic study;[31] this may be related to the nurses' weak theoretical foundations and lower levels of clinical experience and technical operation, which require further improvement.

Marital Status

Nurses have different marital statuses and different attitudes towards patient safety. The results of this survey suggested that unmarried nurses have better attitudes towards patient safety than married nurses, which is different from the results of other studies.[13] The reason for this may be related to the different environments and characteristics of the study group. The overall age of the subjects included in this study was relatively young, the nursing age was relatively low and unmarried people accounted for the largest proportion of respondents. With the recent and rapid development of nursing at home and abroad, the standards for recruiting nursing staff in major hospitals have gradually increased, with most now requiring a college degree or above or even a bachelor's degree or above. Unmarried nurses have a higher comprehensive quality and safety awareness than married nurses. In addition, unmarried nurses have less family pressure, so they can devote more time and energy to work and further education, and, consequently, their level of safety culture is higher.

Practical Implications

At the hospital management level, when considering the quality of nursing services, the working conditions of nursing staff should be improved, humane care measures provided and work satisfaction improved. Managers should attach importance to the patient safety attitude of night shift nurses, improve the department's rota system and reduce the nurses' night shift workload. They should provide night shift nurses with more favourable working conditions to meet their work and life needs, promote their enthusiasm for active learning and improve their overall quality level, thus improving patient safety. At the same time, management should provide a development platform for highly educated nursing staff on the infectious diseases wards, create equal learning and continuing education opportunities, improve the nursing assessment system and increase training, with particular attention to the theoretical knowledge of the less educated nursing staff. Nurses' operation skills should be improved to increase the overall quality level and enhance the safety culture of the infectious diseases ward. Particular attention should be paid to promoting the patient safety culture of married nurses, improving the hospital management system and providing married nurses with more deep learning opportunities, which will improve their attitude to patient safety and, in turn, the whole ward's safety culture.

Limitations and Future Research Recommendation

This study has some limitations. The sample was small and limited to the Hebei Province. Although patient safety is an important topic, there have yet to be universally agreed on conclusions in the relevant research on nurse and patient safety in China or other countries worldwide. Therefore, nurses' knowledge, attitudes, practices and related factors concerning patient safety have not been fully evaluated, affecting this study's discussion. The focus of follow-up studies should be on increasing the sample size, excluding bias and evaluating effective interventions that can enhance the attitude of infectious diseases nurses towards patient safety.

Conclusions

Infectious diseases ward nurses have relatively positive attitudes towards patient safety, but there is still a need for improvement. Nurses who work frequent night shifts, have less nursing experience, have lower education levels and are married have poorer patient safety attitudes. Managers should focus on these groups of nurses and improve their working conditions and job satisfaction to enhance safety awareness further and strengthen the safety culture in hospitals.

Ethics Approval and Consent to Participate

This study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Affiliated Hospital of Hebei University. All participants signed an informed consent form for inclusion in the study.

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Disclosure

The authors report no conflicts of interest in this work.

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