

## Exploring Nursing Students' Perceptions of Patient Safety Culture in China

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### Abstract

Patient safety is related to the quality of care. As nursing students are in the process of learning how to become healthcare professionals, their attitudes toward patient safety are critical to ensuring that patients receive safe and high-quality care. This study aims to provide a strong reference for the development of patient safety education and to help enhance the nursing students' attention to patient safety, thereby contributing to providing safer and more reliable nursing care for patients. To explore in depth the status of nursing students' attitudes towards patient safety and to analyze the factors affecting their attitudes, a rigorous methodology is adopted. The Chinese version of the Safety Attitude Questionnaire (C-SAQ) is used to survey a cohort of 263 nursing students from a medical school in Sichuan, and the collected data is statistically analyzed using SPSS 26.0 software. The total mean score of patient safety attitudes among nursing students was  $66.93 \pm 14.27$ . The mean scores for the six dimensions of patient safety attitudes, ranked in descending order, are as follows: perception of management, working conditions, safety climate, job satisfaction, teamwork climate, and stress recognition. The results of univariate analysis analyses show that nursing students whether they have or have not received patient safety education and those who have not experienced nursing errors during their internship, demonstrate more positive patient safety attitudes ( $p$ -value < 0.05). Patient safety attitudes among nursing students are at a lower to middle level. Each internship teaching hospital should effectively incorporate patient safety education into the entirety of clinical nursing practice education, increase the number of safety education courses for internship nursing students during their internships, and focus on internship nursing students who have experienced nursing errors so that they can further improve the positivity of internship nursing students' attitudes towards patient safety.

**Keywords:** Nursing Students, Patient Safety, Attitudes, Nursing Education, Culture

### Introduction

Patient safety is defined as a risk control process that focuses on reducing unnecessary harm associated with healthcare to an acceptable minimum. The World Health Organization (WHO)

defines patient safety as “the prevention of errors and adverse effects to patients associated with health care” and “to do no harm to patients” (World Health Organization, 2009; Gaal, Verstappen & Wensing, 2011). Approximately 10% of people experience injury while receiving medical care, and over 3 million fatalities are attributed to substandard care each year. Up to 4 out of every 100 deaths in low- to middle-income nations are related to subpar medical care (Slawomirski & Klazinga, 2020). Above 50% of harm (1 in every 20 patients) is preventable; half of this harm is attributed to medications (Panagioti et al., 2019; Hodkinson et al., 2020). Healthcare professionals should take necessary measures to avoid or prevent adverse consequences or injuries to patients during healthcare services. Patient safety serves as one of the important indicators of the quality of nursing services. Because the nature of caregiving work makes nurses have the closest contact with patients, nurses play a crucial role in ensuring patient safety and security. Nurses' patient safety attitude is a key factor in ensuring patient safety. As the reserve force of the future nursing team, whether their attitude towards patient safety is positive or not will have a direct impact on patient safety. The establishment of their safety awareness is also the basis for ensuring the quality of safe nursing care in the future (Hu Yuxiang et al., 2019). The cultivation of patient safety attitudes among nurse trainees has become a key component of current nursing education concerns in China. The study aims to provide a basis for patient safety education during the training phase of clinical practice and to improve the safety attitudes and awareness of nursing students.

### **Background**

The roles played by nursing faculty members are critical and influential in both university and clinical settings. Faculty members are expected to exemplify the values established by their academic and clinical institutions, act as change agents, stay current with the latest teaching and learning strategies and technologies, demonstrate leadership and management skills, and engage in advocacy strategies that promote student and organizational development (National League of Nursing [NLN], 2020). Safe care is a key indicator of clinical governance and risk management programs. The evaluation and identification of its components constitute the main step to improve the quality of care and plan to develop patient safety in clinical practice. For nursing students, the primary challenge in clinical practice is how to enhance patient safety awareness and how to implement safe nursing activities in high-pressure clinical work. Patient safety in nursing education holds significant importance for health professional environments, settings, and care systems. To be effective, safe nursing practice requires effective integration between increasing knowledge and the different clinical practice settings. Nurse educators have the responsibility to foster effective learning processes and ensure patient safety (Bianchi et al., 2016). In nursing education, how can we effectively conduct patient safety education for nursing students before the internship and avoid situations where nursing students do not know how to deal with various patient safety problems under the high pressure of coronavirus prevention and control. Given that nursing students are in the process of learning how to become healthcare professionals, their attitudes toward patient safety are critical to ensuring that patients receive safe and high-quality care. Consequently, nursing students play a critical role in promoting patient safety. Their attitudes toward patient safety are shaped by their education and training, and they are taught to prioritize effective communication, teamwork, prevention, and continuous improvement. By embracing these attitudes, nursing students can help ensure that patients receive safe and high-quality care.

### **Literature Review**

Amidst the rapidly developing and increasingly complex health care system, patient safety has become the focus in the health care field, and providing safe diagnosis, treatment, and nursing services is the goal of the health care system (Bassuni et al., 2015). September 17, 2019, marks the first World Patient Safety Day, with the theme "Patient Safety: Global Health Priorities." World Patient Safety Day reminds all personnel involved in health care to pay attention to the severity of patient safety (WHO, 2021). Every point in the process of patient care has a certain degree of inherent insecurity. Patient safety in health care is an urgent and serious global public health problem, and the resulting patient injuries have imposed a very heavy burden on the health care system. According to the statistics of the World Health Organization (WHO), the occurrence of adverse events caused by unsafe medical care ranks among the top ten major causes of death and disability globally. Every year, about 400,000 people die prematurely due to preventable adverse events, and approximately one-tenth of hospitalized patients are injured as a result. Patient safety problems account for 15% of hospital expenses, but at least 50% of them are preventable (WHO, 2021). The occurrence of patient safety incidents not only results in the loss of life or permanent disability for patients, but also inflicts difficult-to-measure psychological harm on patients and their families.

Study done by Kow et al (2016) reported that the key to patient safety education is prevention, not remedy. Based on the Institute of Medicine (IOM) publication "To Err is Human: Building a Safer Health System," to ensure the safety of patients and reduce the occurrence of medical errors, it is far from enough to just enhance the safety quality of medical institutions. The efforts must start with basic education in schools. Traditional medical education courses focus on training the professional knowledge, skills, and clinical decision-making abilities of medical undergraduates, but the teaching of patient safety and related knowledge is not clear. Therefore, the lack of patient safety education and training for health personnel has become an important hidden danger in the occurrence of adverse medical events. As the primary group directly responsible for future clinical nursing work, nursing students are the potential backbone to maintain patient safety and promote the harmonious development of the medical environment. The lack of patient safety knowledge is one of the problems that lead to unsafe practice of nursing students (Jamshid H et al., 2021). However, in the past 15 years, the global efforts to reduce the burden of patients' injuries have not made substantial changes. According to the action framework of the Global Patient Safety Action Plan 2021-2030 (WHO, 2021), the education and training of health care professionals, as an important tool for improving patient safety challenges, has not been fully utilized and implemented. Therefore, patient safety should be included in the learning of nursing professional courses. Only by improving the nursing students' awareness of patient safety and establishing the students' cognition system of patient safety from theory to practice can students reduce the incidence of nursing adverse events in clinical work and ensure patient safety.

As prospective nurses, nursing students are an indispensable and special group in the hospital nursing team. At the same time, they have high expectations for work and life and pay attention to the reflection of self-worth. However, due to a lack of clinical experience, unskilled operation skills, relatively poor communication skills, lack of a sense of responsibility and dedication, and weak legal awareness, they are a high-risk group of nursing errors. Some literature shows that 40% to 50% of the clinical nursing errors occurring during the practice

of nursing students are related to nursing students. The errors resulting from the independent operation of nursing students without careful implementation of checks account for 60%, and the patient safety problems caused by the lax operation process account for 33.3%. Eighty-six percent of nursing students admit to feeling nervous, inaccurate, and not agile when performing invasive operations, leading to patient distrust and lost opportunities for operation practice (Wujing et al.,2010).

In previous studies, it was found that the Chinese nursing profession does not pay enough attention to the safety awareness of students. The curriculum setting and education on patient safety are still in the exploration period. The education content related to patient safety is mostly in the form of fragments and chapters in different courses, which is usually implicit, lacking systematization and integrity, and prone to confusion of knowledge. These problems are insufficient for patient safety education, which plays an important role in imparting relevant patient safety knowledge to medical education students (Lee et al.,2021). Moreover, in clinical practice, patient safety is not solely a medical or nursing problem; the issues faced and handled require systematic management and multidisciplinary cooperation. Therefore, nursing students do not have a deep understanding of patient safety, so we should consider trying to systematically carry out patient safety education for students from the lower grades to improve their awareness of patient safety. Consequently, the summary of research findings on patient safety culture study findings is shown in Table 1.

Table 1

*The Summary of Research Findings on patient safety culture attitudes*

<b>Lean Initiatives</b>	<b>Sectors</b>	<b>Findings</b>
Patient safety	Hospital	The review showed that, according to the World Health Organization (WHO), the occurrence of adverse events due to unsafe medical care is one of the ten leading causes of death and disability worldwide. Meanwhile, traditional medical education curricula focus on developing undergraduate medical students' professional knowledge, skills, and clinical decision-making abilities, but patient safety and related knowledge are not explicitly taught. Of the total global health expenditure of US\$5.5 trillion, only 2% is spent on professional education and training. Therefore, the lack of patient safety education and training among healthcare professionals has become a significant risk for adverse medical events.
Patient safety culture attitudes	nursing education	The finding showed that nursing students are more prone to making clinical care errors during their internships, a situation that not only jeopardizes the safety and quality of care but also instills fear in nursing students regarding clinical work. Worse still, it may lead to a loss of patient trust in the nursing student.

## **Methodology**

### **Study Population**

From October 2023 to November 2023, a total of 271 nursing students from a higher education institution in Sichuan Province, China, were selected for the survey using a convenience sampling method. The inclusion criteria were (1) full-time nursing undergraduates in school; (2) having entered the training stage of clinical practice and having been in practice for  $\geq 3$  months; and (3) informed consent to voluntarily participate in this survey.

### **Data Collection**

The questionnaire is divided into two sections: Part A: Demographic data [gender, age, current internship department, weekly working hours, whether they had received patient safety education during the internship, and whether they had experienced nursing errors during the internship] and part B: Methods the Chinese version of the Safety Attitude Questionnaire (C-SAQ). The Chinese version of safety attitudes questionnaire (the Chinese version of safety attitudes questionnaire, C-SAQ): The questionnaire was translated and revised by Guo Xia (Guo Xia & Zhou Wei, 2010), a domestic scholar, to the overseas safety attitudes questionnaire (SAQ). The total Cronbach's alpha coefficient of the questionnaire is 0.850, and the re-test reliability is 0.844. The questionnaire consists of 31 items with 6 dimensions: teamwork (6 items), safety atmosphere (7 items), management perception (4 items), job satisfaction (5 items), working conditions (5 items), and stress perception (4 items). A 5-point Likert scale is used, ranging from "strongly disagree" to "strongly agree" on a scale of 1 to 5, with each dimension scored as the mean value of the item it contains. The total Cronbach's alpha coefficient of the questionnaire in this study is 0.935, which indicates that the questionnaire has good internal consistency. Finally, the C-SAQ scores are converted to a 0-100 scale for analysis (1=0, 2=25, 3=50, 4=75 and 5=100), with negatively worded questions to the contrary. A score of  $\geq 75$  indicated a positive attitude towards patient safety culture. Percentages of positive scores (out of 100,  $\geq 75$ ) are calculated for each item and domain. Categorical data are calculated as frequencies and percentages for categorical data and means and standard deviations (SD) for continuous data.

The nursing students participated in a web-based survey conducted through the Questionnaire Star platform. Class counsellors explained the survey's purpose to eligible trainee nursing students, who then voluntarily completed the questionnaire. The questionnaires were completed anonymously following standardized guidelines. A total of 271 questionnaires were received, and after excluding incomplete personal information or consistently chosen questionnaire options, 263 questionnaires were deemed valid, resulting in a validity rate of 97.04%.

### **Data Analysis**

SPSS 26.0 software is used for data analysis. The frequency, mean, standard deviation, T-test, ANOVA test and univariate linear regression analyses are measured. Data with a p-value less than 0.05 was considered statistical significance.

**Results****Analysis of Respondent Sociodemographic Data (n=263)**

The questionnaire was distributed to the public online. A total of 263 questionnaires were collected. Among these students, 88.60% were females and 11.40% were males. Regarding age distribution, those  $\leq 18$  years old accounted for 0.76%, those between 18 and 22 years old accounted for 82.50%, and those  $\geq 22$  years old accounted for 16.74%. In terms of current working departments, internal medicine accounted for 46.01%, surgery accounted for 31.80%, outpatient clinic accounted for 3.22%, emergency clinic accounted for 11.03%, operating theatre accounted for 5.22%, and other departments accounted for 2.18%. Regarding weekly working hours, 11.03% worked for  $\leq 32$  h, 58.56% worked for 33-40 h, and 30.42% worked for  $>40$  h. Additionally, 90.11% received patient safety education during their internship. The percentage of those who had nursing errors during the internship was 28.90%.

Table 2

*Socio-demographic Characteristics of the respondent(n=263)*

Variable	Category	Frequency	Percentage
Gender	Female	233	88.60%
	male	30	11.40%
Age	$\leq 18$	2	0.76%
	18~22	217	82.50%
	$\geq 22$	44	16.74%
Current department	Internal Medicine	121	46.01%
	Surgery	84	31.80%
	Outpatient Department	9	3.22%
	Emergency Treatment	29	11.03%
	Operation Room	14	5.22%
	Others	6	2.18%
Working hours per week	$\leq 32$ (h)	29	11.03%
	32~40(h)	254	58.56%
	$\geq 40$ (h)	80	30.42%
Whether have received patient safety education during the internship	Yes	237	90.11%

	No	26	9.89%
Whether it occurs during the internship nursing errors	Yes	76	28.90%
	No	187	71.10%

**Participants’ Attitudes towards Patient Safety Culture**

The total mean score of patient safety attitudes of nursing students were (66.93±14.27), and the scores of the six dimensions, in descending order, are perception of management, working conditions, safety climate, job satisfaction, teamwork climate, and stress recognition, which are shown in Table 3. Patient safety attitudes with a score of less than 75 out of 31 entries are shown in Table 4.

Table 3  
*Patient safety attitude scores of nursing students (n=263)*

Dimension	Item	Mean (SD)	Maximum Values	Minimum Value
Teamwork climate	6	67.07(17.17)	100.00	16.70
Safety atmosphere	7	72.16(17.10)	100.00	10.71
Perceptions of management	4	79.09(19.42)	100.00	0.00
Job satisfaction	5	71.46(22.99)	100.00	0.00
Working conditions	5	76.79(20.62)	100.00	0.00
Stress recognition	4	27.40(22.48)	100.00	0.00
Totals	31	66.93(14.27)	97.60	18.50

Table 4  
*Entries and scores of nursing students with patient safety attitude scores below 75 (n=263)*

Serial Number	Item	Affiliated Dimensions	Mean (SD)
1	My work efficiency is inefficient when I am tired.	Stress recognition	21.77(26.38)
	Overloaded work can make my work performance worse.		23.10(27.56)
	I am more likely to make mistakes in tense or hostile situations.		25.29(26.71)
	Tired fatigue reduces my ability to cope with emergencies like cardiac arrest.		39.45(35.29)
2	In the department, if I perceive problems related to patient treatment or care, I think it is difficult to speak freely about them.	Teamwork climate	46.67(30.36)
	The opinions and suggestions of the department staff can be fully accepted.		60.65(27.12)
	Correct settlement of differences of opinions during the work.		68.35(27.86)

	Doctors and nurses work very well.		69.77(27.26)
3	It is very difficult to discuss mistakes openly in the department.		47.81(31.39)
	Colleagues will encourage me to report on any patient safety issues that I think of.	Safety climate	72.24(25.28)
	I like my job.		67.11(29.98)
4	Various technical operation procedures are simple.		68.54(29.40)
	I feel very proud to work in this department.	Job Satisfaction	73.1(26.68)
	The moral level of the department members is very high.		73.48(25.71)
5	The department staff level is sufficient to handle the current number of patients.	Working conditions	72.91(28.15)
6	My department is a good place to work.	Perceptions of management	73.76(26.41)

#### **A univariate analysis of nursing students' attitudes toward patient safety**

Patient safety attitude scores of nursing students in practice with different characteristics are analyzed by independent samples t-test and ANOVA (Table 5). The results of the analyses show that the differences between the total mean patient safety attitude scores of nursing students who have or have not received patient safety education during their internship and who have or have not experienced nursing errors during their internship are statistically significant ( $p < 0.05$ ). There are no statistically significant differences between the total mean scores of patient safety attitudes of nursing interns by gender, age, current department, and weekly working hours ( $p > 0.05$ ).

The results of univariate analysis show statistically significant differences ( $p < 0.05$ ) between three sociological data, namely, length of working hours per week, whether they had received patient safety education, and whether they had experienced nursing errors during their internships, and the mean scores of the six dimensions of nursing students' attitudes towards patient safety (Table 5). There is no statistically significant difference between the mean scores of the total patient safety attitudes of the student nurses by gender, age, and department of internship ( $p > 0.05$ ).



Table 5

*Patient safety attitude scores of practice nursing students with different sociological characteristics*

Characteristics	Frequency	Total mean score for patient safety attitudes (SD)	F/t	p
<b>Gender</b>				
male	30	66.96 (15.88)	-	
female	233	66.93 (14.08)	0.0 12	0.99
<b>Age (year)</b>				
≤18	2	59.68 (3.42)		
18~22	217	67.70 (14.19)	1.8 98	0.15 2
≥22	44	63.45 (14.52)		
<b>Current practice department</b>				
Internal Medicine	121	66.03 (12.38)		
Surgery	84	68.08 (13.95)		
Outpatient Department	9	67.29 (15.13)	0.6 15	0.68 8
Emergency Treatment	29	64.84 (21.01)		
Operation Room	14	69.23 (16.77)		
Others	6	72.98 (7.40)		
<b>Working hours per week (h)</b>				
≤32(h)	29	69.99 (11.75)		
32~40(h)	154	67.59 (14.17)	1.9 68	0.14 2
≥40(h)	80	64.54 (14.26)		
<b>Whether or not have received patient safety education</b>				
Yes	237	67.80 (13.95)	3.0 6	0.00 2*
No	26	58.93 (14.85)		
<b>Whether there has been an incident of nursing error</b>				
Yes	76	62.88 (15.68)	- 2.9	0.00 3*
No	187	68.57 (13.34)	79	

\*P < 0.05 statistically significant difference

### Discussion

Safe nursing care is a crucial benchmark for clinical governance and risk management programs. Evaluating and identifying its constituent elements is pivotal for enhancing the quality of nursing care and developing patient safety programs in clinical practice. Chinese nursing specialist education follows a curriculum structure of two years of theoretical study in school and one year of clinical practice in hospitals. For trainee nursing students with little or no clinical work experience, enhancing awareness of patient safety and ensuring the safety

of clinical care poses a significant challenge in practical nursing education. Patient safety in nursing education holds paramount importance in health professional environments, settings, and care systems. Effective, safe nursing practice necessitates a seamless integration of increasing knowledge and different clinical practice settings. Nurse educators bear the responsibility of developing effective learning processes and ensuring patient safety (Bianchi, et al., 2016). Fostering patient safety attitudes among nurse trainees has become a primary focus in nursing education. Various scholars in China have evaluated the patient safety attitudes of trainee nurses and discovered that the scores varied among trainees from different institutions, ranging from moderate to high levels (ChenYuanyuan et al., 2020; Wu Xiaoting et al., 2017).

The results of this survey show that the total mean score of patient safety attitudes of undergraduate nursing students was  $(66.93 \pm 14.27)$ , placing it at the lower-middle level. This indicates that, in general, nurse interns still lack positive patient safety attitudes, leaving ample room for improvement. Among of the six dimensions of patient safety attitude, the scores of management perception and working conditions dimension are high, the scores of safety atmosphere, job satisfaction, and teamwork climate are in the middle, and the scores of stress perception are low. These results suggest that intern nursing students have a high degree of recognition of the patient safety management and working environment of the internship hospitals. However, intern nursing students still perceive factors unfavorable to patient safety in the process of clinical practice. In terms of specific patient safety attitude entries, 16 scores are below 75. For example, in the stress perception dimension, the entry "My work efficiency is inefficient when I am tired." scores the lowest. In the teamwork dimension, the entry "In the department, if I perceive problems related to patient treatment or care, I think it is difficult to speak freely about them." receives the lowest score, and in the safety climate dimension, the entry "It is very difficult to discuss mistakes openly in the department." scores the lowest. Therefore, internship hospitals and departments should establish a reasonable internship scheduling system to reduce the work intensity and pressure of internship nursing students, improve their patient safety attitude, and ensure that internship nursing students have sufficient energy and physical strength to face complicated clinical nursing work. Secondly, a non-punitive patient safety culture should be built so that nursing students can actively participate in patient safety, improve their safety attitude, and discuss patient safety issues with the instructors or clinical staff, providing timely feedback on patient safety hazards. Most importantly, nursing students can now actively report nursing adverse events without the fear of criticism or blame from instructors or even head nurses, factors that could potentially affect their internship results.

Patient safety education in internship hospitals typically only occurs during the internship admission process when students first enter clinical training, with relatively weaker emphasis in clinical department teaching. It is recommended that teaching hospitals integrate systematic patient safety education for nursing students throughout the internship period, incorporating common safety hazards in the clinical environment. Patient safety education should be an integral part of clinical practice training, including regular patient safety training and lectures (Xu Wenli et al., 2017). Enhancing the content of patient safety culture and concentrating on promoting safety attitudes among nursing students will instill an awareness of safe nursing care from the outset of their practice.

Nursing students, due to a lack of work experience and unskilled theoretical knowledge and operational skills, are prone to nursing errors during clinical practice, which can adversely affect patient safety and their own career development. In this study, 28.89% of trainee nursing students reported nursing errors during clinical practice, and those who experienced nursing errors exhibited lower positive attitudes towards patient safety. This finding suggests a negative correlation between the occurrence of nursing errors and nursing students' attitudes towards patient safety. The more negative a student's attitudes towards patient safety are, the higher the incidence of nursing errors. The reason for this may be that nursing students who have experienced nursing errors tend to be more passive in their practice and develop a negative attitude towards patient safety (Xiaohuan et al., 2020). Therefore, clinical teaching teachers should pay increased attention to nursing students who have encountered nursing errors, tailoring safety education and safety awareness development for them. Additionally, encouraging nursing students to actively participate in the management of patient safety and engage in feedback and discussions on patient safety issues can effectively reduce the incidence of nursing errors and enhance their attitudes towards patient safety.

### **Conclusion**

In summary, the patient safety attitudes of nurse students in specialties are rated at the lower-middle level. Factors such as receiving patient safety education and experiencing nursing errors during internships significantly impact the patient safety attitudes of nurse trainees. Nursing education managers in teaching hospitals should conduct regular assessments of the patient safety attitudes of nurse trainees, prioritize education and training on patient safety attitudes, alleviate the work pressure of nursing students, decrease the incidence of nursing errors, and foster a positive cultural atmosphere of patient safety. These efforts aim to comprehensively enhance the patient safety attitudes and awareness of nurse trainees.

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