### <u>ORIGINAL RESEARCH</u>

# Study on the Current Situation of the Intention to Report Adverse Events of Nurses in the Department of Hematology and Its Influencing Factors

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#### ABSTRACT

**Objective** • To investigate the current state of nurses' intentions to report harmful incidents in the hematology department, and the influencing factors, to provide a relevant basis for ensuring healthcare quality and patient safety.

**Methods** • By using a stratified sampling technique, 80 nurses from the hematology department of our hospital between June 2020 and June 2022 were randomly chosen as the research objects. The Chinese version of intention to report adverse event questionnaire (15 items with a scale of 0 to 1), adverse event report cognitive questionnaire (8 items with a scale of 0 to 1), and adverse event reporting attitude questionnaire (25 projects with a scale of 0 to 4) were used to collect data. Multiple linear regression model was used to explore the influencing variables based on the single-factor indicators with statistical significance.

**Results** • When adverse events caused serious casualties or even death, the majority cases (96.25%) were reported to the superior supervisor; when the adverse events did not cause relevant injury, and was in potential vulnerability,

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#### INTRODUCTION

Hematological disease is a common clinical disease. According to relevant statistics, compared with benign hematological disease, malignant hematological disease patients are significantly increased among hospitalized patients, which may account for more than 70% of patients with hematological disease, which not only seriously increases the burden of patients and their families, but also has a serious impact on society.<sup>1-3</sup> the proportion of discussing with colleagues was the most (90.00% and 88.75%, respectively). For cognition on adverse events, "whether they understand the medical safety event reporting system" accounted for the most proportion (98.75%). The nurses had the highest scores for reporting standard [(25.58 ± 6.19) points] and lowest score for reporting purpose [(8.62 ± 1.51) points]. Age, educational background, years of employment, and professional titles were influencing factors of nurses' inclination to report unfavorable events (P < .05).

**Conclusion** • The cognition and reporting attitude of nurses in the hematology department on adverse events need further improvement. The intention of the nurses to report adverse events is influenced by age, educational background, years of experience, and professional titles. Patient safety education especially with simulation-based training should be implemented, to decrease frequency of adverse incidents. (*Altern Ther Health Med.* [E-pub ahead of print.])

Hematology department is a department for the treatment of leukemia, platelet elevation, anemia and many other blood diseases and the quality of nursing staff in the department may have a direct impact on the recovery and treatment of patients.<sup>4,5</sup> Nursing adverse events are a kind of inevitable events in nursing and medical treatment. Even if there is the best professional nursing, most treatments or examinations may cause harm.<sup>6</sup> Although the culture and system of the health care organization may be well developed, due to human factors and a complex adaptive system of health care organization, the occurrence of nursing adverse events is inevitable. It is in a state of change and development.

Hematologic malignancies significantly contribute to the cancer global burden.<sup>7</sup> They are commonly classified into four common subtypes: leukemia, Hodgkin lymphoma, non-Hodgkin lymphoma, and multiple myeloma.<sup>8</sup> There were 309 000 leukemia deaths and 407 000 incident cases in 2018.<sup>9</sup> In 2017, the number of disability-adjusted life years caused by Hodgkin lymphoma, non-Hodgkin lymphoma, and multiple myeloma was 1.4, 7.0, and 2.3 million, respectively.<sup>7</sup> Malignant hematology can range from a chronic condition to a rapidly progressing, often fatal disease. Those with faster progressing diseases, such as acute myeloid leukemia, require more urgent care. Nurses are the first to approach a patient, whether as an inpatient, outpatient or in the emergency department. Therefore, they need to be prepared with patient-centered care approaches, in order to manage a wide range of patients and conditions. Additionally, nurses need to familiar with the possible consequences of a patient's diagnosis, the importance of patient education, and the typical side effects of the treatment plan.<sup>10</sup>

Research indicates that nearly half of the adverse events can be prevented despite the fact that the patient safety risk are unavoidable in the medical process.<sup>11</sup> In 2019, WHO initiated an action to end preventable harm in healthcare.<sup>12</sup> A meta-analysis showed that the prevalence of avoidable adverse events was 6%, and 12% of these were severe or fatal.<sup>13</sup> Nurses are involved in most patient safety occurrences, and over half of them take place in the wards.<sup>14</sup> Clinical evidence reveals that over half of nurses have encountered an adverse event.<sup>15,16</sup> By reducing the likelihood of errors, patient safety can be improved through the monitoring and learning from adverse events. As a result, many countries have established adverse events reporting systems and conducted research on patient safety culture, technical reporting, and guidelines.<sup>17</sup>

Reporting and management of adverse events in nursing is essential in ensuring quality of care.<sup>18</sup> The clinical nursing staff's desire to report unfavorable incidents may have a direct impact on how effective the reporting system is.<sup>19-21</sup> In order to increase the reporting rate of adverse events and lower the risk of adverse events, it is essential to comprehend the current situation of nurses in the hematology department's intention to report adverse incidents and explore the effect of that intention. The adverse event reporting system has gradually been developed and applied to all hospital departments thanks to the implementation of various policies and the advancement of medical science and technology. However, the current state of the intention to report adverse events is still not encouraging. Based on the aforementioned context, this research randomly chose 80 nurses from our hospital's Department of Hematology between June 2020 and June 2022 to serve as the research subjects for analysis. The research's objectives were to examine the current situation of nurses in the department of hematology's intention to report adverse events and analyze its influencing factors in order to increase the reporting rate of adverse events, lower the risk of adverse events, and provide a relevant basis for ensuring healthcare quality and patient safety in the hematology department.

### METHODS

### General data

A total of 80 nurses in the Department of Hematology in our hospital from June 2020 to June 2022 were randomly selected as the research objects by stratified sampling method.

# **Table 1**. Analysis of basic data of nurses in the department of hematology

Variables	n (%)		
Age (years)	≤ 25	12 (15.00)	
	26~44	64 (80.00)	
	≥ 45	4 (5.00)	
Gender	Male	3 (3.75)	
	Female	77 (96.25)	
Education	Junior college or below	54 (67.50)	
qualification	Bachelor degree or above	26 (32.50)	
Nature of	Contract	36 (45.00)	
employment	In preparation	44 (55.00)	
Work experience	≤ 10	47 (58.75)	
(years)	11~14	10 (12.50)	
	≥ 15	23 (28.75)	
Professional title	Nurse	22 (27.50)	
	Senior nurse	39 (48.75)	
	Supervisor nurse and above	19 (23.75)	

Note: The data were presented as number of cases (n) and percentage (%).

**Criteria for enrollment**: (1) All subjects were engaged in the hematology department; (2) The working time of the research object was more than 1 year; (3) All research subjects had nurse practice certificates; (4) All research subjects agreed to participate in the survey and voluntarily participated in the corresponding cooperation; (5) All subjects were in the hospital during the study.

**Exclusion criteria**: (1) Nurses who were not officially on-the-job in our hospital, including nurses who practiced in our hospital and nurses who further studied or reemployed in our hospital; (2) Nurses who did not work in our hospital at the time of the study, including nurses studying outside, nurses on maternity leave, etc.; (3) Nurses who did not work in the department of hematology. The 80 nurses in the department of hematology who met the standard were statistically analyzed. Table 1 summarizes the basic data of nurses in age, gender, working years, professional titles, etc.

#### **Basic data collection**

The basic data of all research subjects were collected, including age ( $\leq 25$  years, 26-45 years,  $\geq 45$  years), gender (male, female), education qualifications (college and below, undergraduate and above), nature of employment (contract, in preparation), working years ( $\leq 10$  years, 11-14 years,  $\geq 15$  years), professional titles (nurse, senior nurse, nurse in charge and above), etc.

### Questionnaire by the hematology nurses

Questionnaire about the desire to report adverse events. The intention of nurses working in the hematology department to report adverse occurrences was examined using the adverse event reporting intention questionnaire's Chinese translation, including five types of adverse events, including the situation that caused heavy casualties or even death, the situation that caused moderate injury, the situation that caused minor injury and did not need to be treated, the situation that did not cause related injury and potential loopholes, with a total of 15 items, and each item was scored on a dichotomous scale of 0 to 1 (0 for "no" and 1 for "yes"), including three dimensions, namely discussing with colleagues, filling in the report and reporting with the superior supervisor with a total score of 15 points. The higher the total score was, the higher the intention of hematology nurses to report adverse events.

Adverse event cognition questionnaire. According to the adverse event report cognition questionnaire, the cognition of nurses in the department of hematology on adverse events was analyzed, with a total of 8 items, including "whether they understand the medical safety event reporting system", "whether they understand how to report," and "whether they understand how to get the report form", was scored on a dichotomous scale of 0 to 1 for each item (0 for "no" and 1 for "yes"), and 8 for the total score. The higher the score, the higher was the cognition of nurses in the department of hematology on adverse events.

Attitude questionnaire for adverse event reporting. According to the adverse event reporting attitude questionnaire, the attitude of nurses in the department of hematology on reporting adverse events was analyzed, including four dimensions, namely, the reporting environment, objective, standard and influence, with an overall of 25 projects. Each project received a grade of 0 to 4, for a total of 100 points. The worser the attitude of the nurses in the department towards reporting adverse events, the higher the overall grade was. The score for each entry are on a scale of 0 to 4

#### **Observation indexes**

(1) The intention of nurses working in the hematology department to report adverse occurrences was examined using the adverse event reporting intention questionnaire's Chinese translation. (2)According to the adverse event report cognitive questionnaire, the cognition of nurses in the department of hematology on adverse events was analyzed. (3) According to the adverse event reporting attitude questionnaire, the attitude of nurses in the department of hematology on reporting adverse events was analyzed. (4) In the hematology department, the single-factor indicators of the current state of the intention to report adverse occurrences of nurses were examined. The multiple linear regression model was used to discuss the influencing variables of the existing situation of the desire to report adverse occurrences of nurses in the department of hematology based on indicators with statistical significance in a single factor.

#### Statistical methods

In this investigation, the count data were reported as [n (%)]. The measurement data of the adverse event reporting intention scores of different ages, genders, educational qualifications, employment nature, working years, professional titles, and other data were expressed in the form of  $(\pm s)$ , which were in line with the normal distribution. The one-way multiple sample variance test was utilized between multiple teams, and the independent sample *t* test was employed to compare measurement data between the two teams. The hematology department nurses intention to

**Table 2.** Analysis of the current situation of the intention to report adverse events of nurses in the department of hematology

		Conditions causing heavy casualties or even death	Conditions causing moderate injury	Conditions causing minor injury and required no treatment	No relevant injury	Potential vulnerabilities
Dimension	Intention	n (%)	n (%)	n (%)	n (%)	n (%)
Discussing with	Yes	75 (93.75)	74 (92.50)	73 (91.25)	72 (90.00)	71 (88.75)
colleagues	No	5 (6.25)	6 (7.50)	7 (8.75)	8 (10.00)	9 (11.25)
Filling in the	Yes	75 (93.75)	77 (96.25)	64 (80.00)	48 (60.00)	48 (60.00)
report	No	5 (6.25)	3 (3.75)	16 (20.00)	32 (40.00)	32 (40.00)
Reporting to	Yes	77 (96.25)	76 (95.00)	73 (91.25)	68 (85.00)	65 (81.25)
superior	No	3 (3.75)	4 (5.00)	7 (8.75)	12 (15.00)	15 (18.75)
supervisor						

Note: The data were presented as number of cases (n) and percentage (%).

report adverse events was examined using a multiple linear regression model to examine the relationship between the nurses in the department of hematology's intention to report adverse events and its influencing factors. In this study, SPSS24.0 software was used for statistical data analysis, and the statistical result with P < .05 was regarded as the difference with statistical significance.

#### RESULTS

# Analysis of the current purpose of nurses in the hematology department to report adverse occurrences

When adverse events caused serious casualties or even death, the majority cases were reported to the superior supervisor, accounting for 96.25%; when the adverse events caused moderate injury, the majority filled in the report, accounting for 96.25%, followed by reporting to the superior, accounting for 95.00%; when the adverse events caused minor injury and did not need to be handled, the proportion of discussing with colleagues or reporting with the superior supervisor was more, accounting for 91.25%, while the proportion of filling in the report was the lowest, accounting for 80.00%; when the adverse events did not cause relevant injury, the proportion of discussing with colleagues accounted for the most, accounting for 90.00%, followed by reporting with the superior supervisor, accounting for 85.00%, and finally filling in the report, accounting for 60.00%; when the adverse events were in the potential loophole, the proportion of discussing with colleagues accounted for the most, accounting for 88.75%, followed by reporting with the superior supervisor, accounting for 81.25%, and finally filling in the report, accounting for 60.00% (Table 2).

# Analysis of nurses' cognition of adverse events in the department of hematology

In the cognition of nurses in the hematology department on adverse events, "whether they understand the medical safety event reporting system" accounted for the most proportion, accounting for 98.75%, followed by "whether they establish a relevant system", accounting for 97.50%, and "whether they understand how to get the report form" and "whether they listen to or have read the report of colleagues" accounted for the least proportion, accounting for 48.75% (Table 3). **Table 3.** Analysis of nurses' cognition of adverse events in thedepartment of hematology

Item		n (%)
Whether they understand the medical safety event reporting system		79 (98.75)
	No	1 (1.25)
Whether they establish a relevant system	Yes	78 (97.50)
· · ·	No	2 (2.50)
Whether they receive relevant training	Yes	41 (51.25)
	No	39 (48.75)
Whether they know how to get the report form	Yes	39 (48.75)
	No	41 (51.25)
Whether the adverse event report form has been filled	Yes	42 (52.50)
	No	38 (47.50)
Whether they listen to or have read the reports of colleagues	Yes	39 (48.75)
	No	41 (51.25)
Whether they know how to report	Yes	43 (53.75)
	No	37 (46.25)
Whether they have mastered the content of the reporting system for	Yes	43 (53.75)
individual medical accidents of major medical negligence	No	37 (46.25)

Note: The data were presented as number of cases (n) and percentage (%).

**Table 4.** Analysis of the attitude of nurses in the hematologydepartment on reporting adverse events

Dimension	Project (n)	Scores (points)		
Environment	8	19.18 ± 9.08		
Objective	3	8.62 ± 1.51		
Standard	9	25.58 ± 6.19		
Influence	5	$14.16 \pm 2.85$		
Total score	25	67.54 ± 19.83		

Note: The score for each project are on a scale of 0 to 4. The data were presented as number of project (n), and mean $\pm$ standard deviation ( $\pm$  s).

**Table 5.** Single factor analysis of adverse event reporting intention of nurses in the department of hematology based on demographics

Variables		Number of cases	Intention score	t/F	P value
Age (years)	≤ 25	12	$10.03 \pm 2.51$	4.816	.011
	26~44	64	$12.26 \pm 2.72$		
	≥ 45	4	$14.19 \pm 2.93$		
Gender	Male	3	12.75 ± 3.52	0.396	.693
	Female	77	$12.08 \pm 2.85$		
Education	Junior college or below	54	10.73 ± 1.19	8.587	<.001
qualifications	Bachelor degree or above	26	$13.14 \pm 1.14$		
Nature of	Contract	36	$12.87 \pm 1.28$	0.787	.434
employment	In preparation	44	$12.64 \pm 1.30$		
Working years	≤ 10	47	9.13 ± 2.19	19.246	<.001
(years)	11~14	10	11.55 ± 2.28		
	≥ 15	23	13.07 ± 3.25		
Professional	Nurse	22	9.27 ± 2.49	9.057	<.001
titles	Senior nurse	39	$11.38 \pm 2.71$		
	Supervisor nurse and above	19	12.96 ± 3.28		

Note: The intention score was presented as mean $\pm$ standard deviation ( $\pm$  s).

**Table 6.** A multivariate examination of the current purposeof nurses in the hematology department to report adverseoccurrences

Indexes	B value	Standard error	B value	t value	P value
Age	0.292	0.134	0.108	2.246	.012
Educational qualifications	0.163	0.075	0.141	2.304	.030
Working years	0.179	0.085	0.137	2.330	.019
Professional titles	0.358	0.113	0.103	2.076	.031
Constant term	4.588	0.073	_	20.462	<.001

Note: All the variables included in the model were found to be statistically significant (P < .05).

# Analysis of the attitude of nurses in the department of hematology on reporting adverse events

As for the scores of attitude, the nurses in the department of hematology had the highest scores for reporting standard, which was (25.58  $\pm$  6.19) points and had the lowest score for reporting purposes, which was (8.62  $\pm$  1.51) points (Table 4).

# Hematology department nurses' desire to report adverse events: a single-variable analysis

According to univariate analysis, variations in adverse event frequency were statistically important reporting intention scores among nurses in the department of hematology in different ages (F=4.816, P = .011), educational qualifications (F=8.587, P < .001), working years (F=19.246, P < .001) and professional titles (F=9.057, P < .001) (P < .05); nevertheless, there was no statistical significance in sex (F=0.396, P = .693) and nature of employment (F=0.787, P = .434) (P > .05) (Table 5).

### A multivariate examination of the current purpose of nurses in the hematology department to report adverse occurrences

According to multiple linear stepwise regression analysis, age, educational qualifications, working years and professional titles were the influencing factors of adverse event reporting intention of nurses in the department of hematology (P < .05). This might be due to the reason that, nurses with increasing age, education qualifications, working years and professional title have more knowledge or experience in their field, and thus more aware of the adverse events reporting (Table 6).

### DISCUSSION

The development of the health system is not aided by unfavorable nursing occurrences, which can easily result in accidents and disagreements that interfere with routine medical work and staff safety.<sup>22</sup> The health and safety of clients have emerged as society's top priority as a result of the quick development of modern medicine. Medical management includes client safety as a key component. Studies and events have shown that<sup>23-25</sup> the classification management, event analysis and improvement measures of adverse nursing events are beneficial, particularly for the health system to continuously enhance the standard of medical care and lower the frequency of unfavorable nursing occurrences. In general, hematological diseases have the characteristics of rapid development, difficult cure and long duration, which seriously increases the pain of patients and increases the psychological burden of patients.<sup>26,27</sup> The nursing work in the department of hematology is more intensive and difficult than that in the general ward, which requires nursing staff to have high professional skills to provide professional and high-quality services for patients with hematological diseases so as to reduce patients' negative psychological emotions, improve patients' prognosis, and improve patients' quality of life.28,29

The nursing quality evaluation is a complex and meticulous work. With the development of nursing science,

the extension of nursing connotation and the content of clinical nursing quality evaluation are changed accordingly.<sup>30-33</sup> In this research, the intention of nurses to report adverse events in the department of hematology is examined in the context of the current circumstances; the results showed that when adverse events caused serious casualties or even death, caused moderate injury, and caused minor injury and did not need to be handled, the proportions in reporting to the superior supervisor and discussing with colleagues were more than 90%; while when adverse events were in potential vulnerabilities, the proportion of discussing with colleagues was less than 90%, but the proportion was still as high as 88.75%. With the increase in the degree of adverse events, the higher the proportion of reporting to the superior supervisor; when adverse events did not cause relevant injuries and were in potential vulnerabilities, the proportion in discussing with colleagues was the highest. The reason may be that with the increasing severity of nursing adverse events, nurses can't deal with and bear the relevant consequences independently. Multidisciplinary teamwork might be necessary to reduce undesirable effect.<sup>34</sup> When the adverse events were in potential vunerabilities, the nurses may tend to get some peer support when discussing with colleagues. When adverse events are in potential loopholes, the impact on patients is small or will not cause a relevant impact, so they mainly adopt the methods in discussing with colleagues.<sup>35-37</sup>

In this study, the cognition of nurses in the department of hematology on adverse events was analyzed. It was found that the proportions of "whether they know how to get the report form" and "whether they listen to or have seen the report of colleagues" were lower. It indicates that the cognition of hematology nurses on adverse events needs further improvement. In addition, nurses in the department of hematology scored ( $67.54 \pm 19.83$ ) points for their attitude toward reporting adverse events, which was slightly above the middle. It is believed that the attitude of nurses in the department of hematology to the reporting of adverse events is between agreement and disagreement, which is similar to the research of related scholars.<sup>38,39</sup> It may be related to the rapid development of the condition of patients with hematological diseases, more complications and more difficult treatment, the large workload of nurses, and the tense relationship between nurses and patients. Participating in reviews with patients and their families, communicating with them compassionately, and paying attention to their risks could enhance patient safety and quality of care.

Additionally, the influencing factors for intention of adverse event reporting of nurses in the department of hematology in this study were analyzed, and it was found that age, education qualifications, working years and professional titles were the influencing factors of adverse event reporting intention of nurses in the department of hematology. The reasons were that with the increasing age of nurses in the department of hematology, the working years are gradually increasing, so the necessity of adverse event reporting is more profound. In addition, nurses with higher education

qualifications and high professional titles have more knowledge, have more medical literacy, and have more strict requirements for themselves. Some studies<sup>40</sup> found that the incidence of nursing adverse events of clinical practice nurses was 17.8%. The positive response rate of clinical nursing students to safety attitude and professionalism was 57.5% -96.9%. Hence, the education level, hospital region, safety culture and professional behavior experience were the main factors affecting nursing adverse events. In addition, a study<sup>41</sup> found that the awareness and barriers of adverse event reporting were positively correlated with nurses' willingness to report adverse events, while the awareness and barriers of adverse event reporting and the professional title all affected nurses' willingness to report adverse events. The study found that reporting awareness of adverse events increased with age, duration of employment and level of professional title. Biresaw et al.<sup>42</sup> revealed that training age and information on patient safety was significantly associated with the nurses' knowledge and attitude.

Previous studies found that nurses do not volunteer to report adverse events mainly due to fear of punishment and discrimination,<sup>43,44</sup> and nurses intention to report are influenced by their perceptions of reporting benefits.<sup>41,45</sup> Healthcare organizations should view errors as a valuable learning opportunity to improve patient safety than as a personal failure.

It is believed that nursing educators should implement patient safety education in theoretical and practical teaching and adopt various forms, especially simulation-based training, to strengthen safe nursing behavior, improve nurses' reporting awareness, reduce reporting barriers, and improve the willingness to report adverse events, in order to decrease the frequency of adverse nursing incidents.

However, this study has certain limitations, including insufficient sample size and short research cycle. Therefore, the sample size will be further expanded in future studies to verify this conclusion. Future studies may include psychological, social and environmental factors to further investigate the factors influencing reporting intentions. Multi-center studies may increase the population diversity and generalizability.

In conclusion, nurses in the department of hematology have a lower intention to report adverse events when adverse events do not cause related injuries and are in potential vulnerabilities; the cognition and reporting attitude of nurses in the department of hematology on adverse events need further improvement. The intention of nurses in the department of hematology to report adverse events is influenced by age, educational background, years of experience, and professional titles.

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