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Perception of Patient Safety and the Reporting System Between Medical Staffs and Patients in China: A Cross-Sectional Online Study

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Objective: This study aimed to understand the perception of patient safety and the reporting system in public in China, and make further recommendations for the optimization of the reporting system of patient safety.

Methods: The following data were collected through an online questionnaire from medical staffs and patients: recognition of patient safety, comments on patient participation, comments on spontaneous reports, attitudes toward the principles of spontaneous reports, and willingness to participate. This information was presented with frequency and percentage with 95% confidence intervals (CIs). Spearman rank correlation was used to evaluate the association of those data.

Results: A total of 27,493 valid questionnaires were collected in this study. The participants who knew patient safety very well, regarded patients as an essential part to enhance patient safety, viewed spontaneous reports helpful, agreed on the 3 principles of voluntariness, anonymity, and nonpunishment of the reporter, and were willing to participate in reporting were accounted for 39.2% (95% CI, 38.6%–39.8%), 31.2% (95% CI, 30.7%–31.8%), 25.2% (95% CI, 24.7%–25.7%), 24.0% (95% CI, 23.5%–24.5%), and 19.9% (95% CI, 19.4%–20.4%), respectively. A moderate positive correlation was observed between comments on spontaneous reports and attitudes toward the principles of spontaneous reports (medical staffs versus patients, $r_s = 0.452$ versus $r_s = 0.439$; both, $P < 0.01$), as well as comments on patient participation and comments on spontaneous reports (medical staffs versus patients, $r_s = 0.410$ versus $r_s = 0.460$; both, $P < 0.01$).

Conclusions: The awareness of patient safety may influence the choices of the other questions subsequently and may affect their voluntariness for safety reports ultimately. Pertinent measures, such as publicity of the relevant concept, simplification of the reporting procedures, and promotion of incentive mechanisms, should be adopted to promote the optimization of the reporting system.

Key Words: patient safety, spontaneous reports, reporting system, system optimization

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Patient safety is to take necessary measures to prevent adverse events, such as mistakes, errors, and accidents, during a health care process.¹ With the development of hospital administration and promotion of patients' self-consciousness, patient safety has been attached great importance by the World Health Organization

and other health care institutions worldwide. Adverse events are prominent problems in patient safety.² Studies have shown that approximately 3.5% to 16.6% of acute hospitalized patients have experienced medical adverse events.³ Based on China's 243.36 million patients in 2017, it is estimated that if no measures are taken, there may be 8.552 million to 40.5638 million medical adverse events every year. If 40% of the adverse events are prevented by the system, then 3.42 million to 16.22 million cases of medical adverse event can be avoided every year.⁴ Therefore, it is an essential task to construct a self-contained reporting system to increase the efficiency in the reporting and subsequent control of adverse events.²

The establishment of a unified and standardized reporting system can decrease the possibility of these events.⁵ However, there is still a long way to go for China to construct effective reporting systems. In 2004, the medical accident reporting system was initiated nationwide in China, but the incomplete collection limited the validity of this system.⁶ Another reporting system as a follow-up program was set up by the Chinese Medical Doctor Association in 2008. This system was only open to the hospitals whose administrators applied to use. Implementations and using effects have not been published before.⁷ Neither the compulsory nor the spontaneous reporting system in China launched by local medical institutions acquired enough feedback,⁸ on the account of system imperfection, inactive participation, privacy issues, and unfamiliarity with the system.⁶ Most previous research mainly focused on medical staffs rather than the public. It is necessary to design a reporting system to create a safer medical environment based on the needs of the public and the current situation in China. Thus, this study aims to investigate the public recognition of patient safety, willingness to participate, and attitude toward the reporting principles; to analyze the key impact factors on comments on the reporting system; and to make recommendations on the optimization of the reporting system of patient safety.

PARTICIPANTS AND METHODS

Participants

This is a cross-sectional online study with a total of 27,493 participants. The subjects were from netizens who were concerned about the "National Medical Center" WeChat public platform, including medical staff and patients. Participants who were older than 18 years, with full capacity for civil conduct, and able to use the smartphone and read the message were included in our study. Participants who were younger than 18 years, were unable to read or use a smartphone, or lacked the full capacity for civil conduct were excluded from our study.

Methods

Initiated by the National Health Management Service Guidance Center of the National Health and Health Commission, the

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Qianying Jin has the same contribution as Zhun Xiang.

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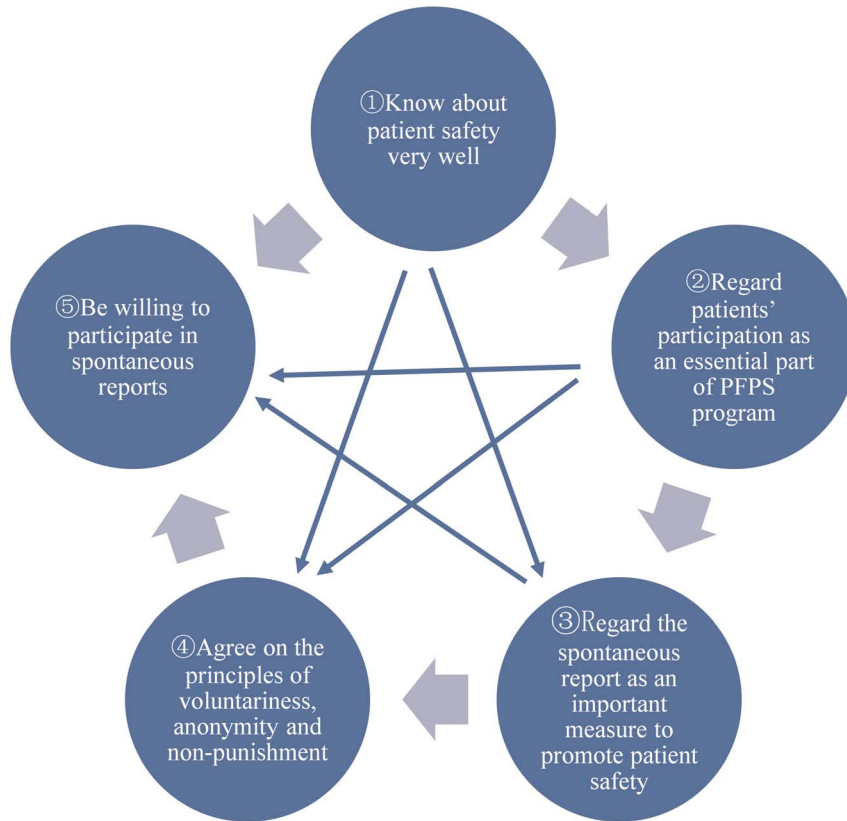


FIGURE 1. The model of 5 factors in the reporting system of patient safety. ① signifies direct association; ② → signifies indirect association.

survey was conducted with the help of the WeChat public platform “National Medical Management Center.” WeChat is a widespread smartphone application in China with functions of sharing messages, photographs, audios, and videos.⁹ The public platform, referred to as the public number, is to establish an account on WeChat and use the account to conduct self-media activities, including one-to-many message push and share functions.¹⁰ The survey was launched on August 10, 2018, and the questionnaire was published on the public platform of the National Medical Management Center. The public can click on the questionnaire link to fill in the form. WeChat background automatically collected the results, and the survey ended at 24:00 hours on August 17.

Survey Content

Our survey was a part of the questionnaire on the management of patient safety developed by the National Health Commission of China in 2018. The design of the questionnaire had been assessed by experts, and a pilot study showed satisfying reliability and validity. The following information and questions were collected in this survey: (1) demographic characteristics such as career, sex, age, and region; (2) recognition of patient safety (ROPS; sample question: Assuring patient safety and reducing avoidable harm are basic requirements in the health care service, which contribute to the Healthy China Program? To what extent do you know about patient safety?); (3) comments on patients’ participation (COPP; sample question: A robust mechanism to enhance the patient safety needs to be built, where the central government is responsible for overall planning, medical institutions are responsible for implementation, and the public are actively participating? How do you like the role of patients in this mechanism?); (4) comments

TABLE 1. Demographic Characteristics of the Participants (n = 27,493)

| Demographic Characteristics | No. | % | 95% CI, % |
|-----------------------------|--------|------|----------------|
| Sex | | | |
| Male | 11,764 | 42.8 | (42.22–43.38) |
| Female | 15,729 | 57.2 | (56.62–57.78) |
| Age-y | | | |
| 18–19 | 770 | 2.8 | (2.60–3.00) |
| 20–29 | 4366 | 15.9 | (15.47–16.33) |
| 30–39 | 6372 | 23.2 | (22.70–23.70) |
| 40–49 | 8997 | 32.7 | (32.15–33.25) |
| 50–59 | 5396 | 19.6 | (19.13–20.07) |
| ≥60 | 1592 | 5.8 | (5.52–6.08) |
| Occupation | | | |
| Medical staff | 12,522 | 45.5 | (44.91–46.09) |
| Nonmedical staff | 14,971 | 54.5 | (53.91–55.09) |
| Region | | | |
| Northeast | 1796 | 6.5 | (6.21–6.79) |
| North | 2878 | 10.5 | (10.14–10.86) |
| East | 8428 | 30.7 | (30.15–31.25) |
| South | 3114 | 11.3 | (10.93–11.67v) |
| Central | 4915 | 17.9 | (17.45–18.35) |
| Northwest | 1888 | 6.9 | (6.60–7.20) |
| Southwest | 4328 | 15.7 | (15.27–16.13v) |
| Overseas | 146 | 0.5 | (0.42–0.58) |

TABLE 2. Distribution of Choices of the 5 Questions (n = 27,493)

| Do You Know About Patient Safety? | | | How Do You Like the Role of Patients in This Mechanism? | | | How Do You Like the Function of Spontaneous Reports? | | | Do You Agree With Those 3 Principles? | | | Would You Like to Report the Safety Events or Potential Danger Voluntarily? | | |
|-----------------------------------|-------|------------------|---|------|------------------|--|------|------------------|---------------------------------------|------|------------------|---|------|---------------|
| Rank | n | Proportion, % | Rank | n | Proportion, % | Rank | n | Proportion, % | Rank | n | Proportion, % | Rank | n | Proportion, % |
| | | 95%CI, % | | | 95%CI, % | | | 95%CI, % | | | 95%CI, % | | | 95%CI, % |
| Very well | 19.9 | 39.2 (19.4–20.4) | | | | | | | | | | | | |
| | 10773 | 39.2 (38.6,39.8) | Helpful | 8588 | 31.2 (30.7,31.8) | | | | Agree | 6604 | 24.0 (23.5–24.5) | Under certain conditions | 1107 | 4.0 (3.8–4.3) |
| | | | | | | Helpful | 6919 | 25.2 (24.7,25.7) | Partially agree | 303 | 1.1 (1.0–1.2) | Under certain conditions | 129 | 0.5 (0.4–0.5) |
| | | | | | | | | | Disagree or others | 12 | 0.0 (0.0–0.1) | Under certain conditions | 6 | 0.0 (0.0–0.0) |
| | | | | | | | | | Agree | 1093 | 4.0 (3.7–4.2) | Under certain conditions | 511 | 1.9 (1.7–2.0) |
| | | | | | | Not essential | 1518 | 5.5 (5.3–5.8) | Partially agree | 415 | 1.5 (1.4–1.7) | Under certain conditions | 257 | 0.9 (0.8–1.0) |
| | | | | | | | | | Disagree or others | 10 | 0.0 (0.0–0.1) | Under certain conditions | 6 | 0.0 (0.0–0.0) |
| | | | | | | | | | Agree | 73 | 0.3 (0.2–0.3) | Under certain conditions | 28 | 0.1 (0.1–0.1) |
| | | | | | | Unhelpful or others | | | Partially agree | 63 | 0.2 (0.2–0.3) | Under certain conditions | 42 | 0.2 (0.1–0.2) |
| | | | | | | | | | Disagree or others | 15 | 0.1 (0.0–0.1) | Under certain conditions | 5 | 0.0 (0.0–0.0) |
| | | | | | | | | | Agree | 5 | 0.0 (0.0–0.0) | Under certain conditions | 6 | 0.0 (0.0–0.0) |
| | | | | | | | | | Partially agree | 4 | 0.0 (0.0–0.0) | Under certain conditions | 5 | 0.0 (0.0–0.0) |
| | | | | | | | | | Disagree or others | 6 | 0.0 (0.0–0.0) | Under certain conditions | 6 | 0.0 (0.0–0.0) |
| | | | | | | | | | Agree | 5 | 0.0 (0.0–0.0) | Under certain conditions | 5 | 0.0 (0.0–0.0) |
| | | | | | | | | | Partially agree | 4 | 0.0 (0.0–0.0) | Under certain conditions | 4 | 0.0 (0.0–0.0) |
| | | | | | | | | | Disagree or others | 5 | 0.0 (0.0–0.0) | Under certain conditions | 5 | 0.0 (0.0–0.0) |
| | | | | | | | | | Agree | 6 | 0.0 (0.0–0.0) | Under certain conditions | 6 | 0.0 (0.0–0.0) |
| | | | | | | | | | Partially agree | 5 | 0.0 (0.0–0.0) | Under certain conditions | 5 | 0.0 (0.0–0.0) |
| | | | | | | | | | Disagree or others | 6 | 0.0 (0.0–0.0) | Under certain conditions | 6 | 0.0 (0.0–0.0) |

(Continued next page)

| | | | | | | | | |
|--|--------------------|-----|-----|-----------|--------------------------|----|-----|-----------|
| | Agree | 104 | 0.4 | (0.3–0.5) | Under certain conditions | 33 | 0.1 | (0.1–0.2) |
| | | | | | No or others | 4 | 0.0 | (0.0–0.0) |
| | Partially agree | 14 | 0.1 | (0.0–0.1) | Under certain conditions | 8 | 0.0 | (0.0–0.0) |
| | | | | | No or others | 1 | 0.0 | (0.0–0.0) |
| | | | | | Yes | 2 | 0.0 | (0.0–0.0) |
| | Disagree or others | 4 | 0.0 | (0.0–0.0) | Under certain conditions | 1 | 0.0 | (0.0–0.0) |
| | | | | | No or others | 1 | 0.0 | (0.0–0.0) |
| | | | | | Yes | 86 | 0.3 | (0.2–0.4) |
| | Agree | 155 | 0.6 | (0.5–0.7) | Under certain conditions | 64 | 0.2 | (0.2–0.3) |
| | | | | | No or others | 5 | 0.0 | (0.0–0.0) |
| | Partially agree | 139 | 0.5 | (0.4–0.6) | Under certain conditions | 37 | 0.1 | (0.1–0.2) |
| | | | | | No or others | 5 | 0.0 | (0.0–0.0) |
| | | | | | Yes | 91 | 0.3 | (0.3–0.4) |
| | | | | | Under certain conditions | | | |
| | | | | | No or others | 11 | 0.0 | (0.0–0.1) |
| | | | | | Yes | 7 | 0.0 | (0.0–0.0) |
| | Disagree or others | 28 | 0.1 | (0.1–0.1) | Under certain conditions | 15 | 0.1 | (0.0–0.1) |
| | | | | | No or others | 6 | 0.0 | (0.0–0.0) |
| | | | | | Yes | 20 | 0.1 | (0.0–0.1) |
| | Agree | 35 | 0.1 | (0.1–0.2) | Under certain conditions | 15 | 0.1 | (0.0–0.1) |
| | | | | | No or others | 0 | 0.0 | (0.0–0.0) |
| | | | | | Yes | 8 | 0.0 | (0.0–0.0) |
| | Partially agree | 60 | 0.2 | (0.2–0.3) | Under certain conditions | 43 | 0.2 | (0.1–0.2) |
| | | | | | No or others | 9 | 0.0 | (0.0–0.1) |
| | | | | | Yes | 8 | 0.0 | (0.0–0.0) |
| | Disagree or others | 57 | 0.2 | (0.2–0.3) | Under certain conditions | 31 | 0.1 | (0.1–0.2) |
| | | | | | No or others | 18 | 0.1 | (0.0–0.1) |

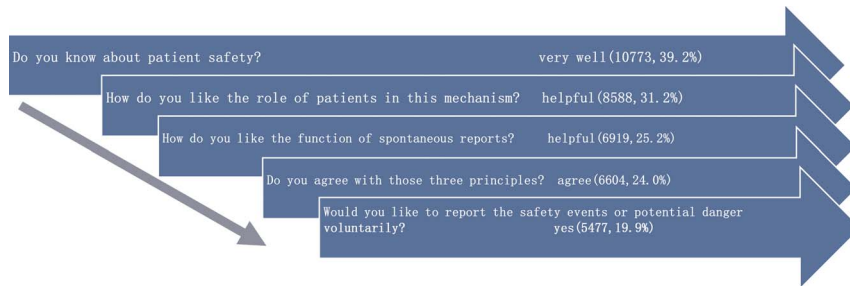


FIGURE 2. The distribution of choices of the 5 questions (n = 27,493).

on spontaneous reports (COSR; sample question: Spontaneous reports on patient safety can promote cooperation and communication between health care providers and patients. How do you like the function of spontaneous reports?); (5) attitudes toward the principles of spontaneous reports (ATP) (sample question: The spontaneous reports, following the principles of voluntariness, anonymity, and nonpunishment of the reporter, are designed to decrease the preventable adverse events. Do you agree on the 3 principles?); (6) willingness to participate (WTP; sample question: We will construct the Patient Safety Reporting System as a platform to arouse people’s awareness of personal safety during health care services. Would you like to report the safety events or potential danger voluntarily?) As shown in Figure 1, the model of this survey consists of 5 questions from the questionnaire. Any 2 of these 5 are associated. For example, if participants start from the choice of knowing about patient safety very well, the conclusion can be drawn that the participants will regard patients’ participation as an essential part of Patients for Patient Safety program; regard the spontaneous report as an important measure to promote patient safety; agree with the principles of voluntariness, anonymity, and nonpunishment of the reporter; and are willing to participate in spontaneous reports.

Statistical Analysis

Data were extracted from the National Medical Management Center WeChat public platform, and statistical analysis was conducted by using SPSS (Version 22.0; IBM SPSS Statistics, Armonk, New York). Demographic characteristics and other factors in the questionnaire were presented with frequency and percentage with 95% confidence interval (CI). Spearman rank correlation was used to evaluate the association between any 2

of the 5 questions, including ROPS, COPP, COSR, ATP, and WTP. $P < 0.05$ was considered statistically significant.

Quality Control

This research was initiated and supervised by the National Health Commission of China, and the notice was issued in advance on the public number of the National Medical Management Center to ensure the smooth progress of the research. Every Internet Protocol address was allowed only one submission, and the demographic characteristics collected in the questionnaire should accord with those recorded during participant registration. Questionnaires failed to be imported into SPSS from WeChat public platform were excluded from our study.

RESULTS

Demographic characteristics

A total of 27,493 valid questionnaires were collected in this study. Demographic characteristics of the participants are shown in Table 1. Most participants were female (15,729; 57.2%) and aged between 40 and 49 years (8997; 32.7%). More than half of them worked in nonmedical institutions (14,971; 54.5%). As for regional distribution, most of them came from East China (8428; 30.7%) and Central China (4915; 17.9%).

ROPS and Comments on Current Situation of Patient Safety

Table 2 demonstrated the choices of 5 questions, including their cognition of patient safety and comments on current

TABLE 3. Correlation Analysis of COPP (n = 27,493)

| Variable | Rank | How Do You Like the Role of Patients in This Program? | | | | | | | | | |
|--|-----------------------|---|-----------|-----------------------|-------|-------|----------|-----------|-----------------------|-------|-------|
| | | Medical Staffs | | | | | Patients | | | | |
| | | Helpful | Essential | Not helpful or Others | r_s | P | Helpful | Essential | Not helpful or Others | r_s | P |
| How much do you know about patient safety? | Very well | 6103 | 1123 | 457 | 0.157 | <0.01 | 2485 | 389 | 139 | 0.216 | <0.01 |
| | A little | 3018 | 985 | 433 | | | 4940 | 1859 | 932 | | |
| | Do not know or others | 196 | 107 | 100 | | | 2302 | 872 | 1053 | | |
| How do you like the role of spontaneous reports in this program? | Helpful | 6836 | 815 | 158 | 0.410 | <0.01 | 7086 | 1105 | 405 | 0.460 | <0.01 |
| | Not essential | 2266 | 1255 | 596 | | | 2362 | 1784 | 1064 | | |
| | Unhelpful or others | 215 | 145 | 236 | | | 279 | 231 | 655 | | |
| Do you agree on the 3 principles? | Agree | 8061 | 1312 | 435 | 0.356 | <0.01 | 8179 | 1754 | 977 | 0.360 | <0.01 |
| | Partly agree | 1210 | 837 | 396 | | | 1456 | 1258 | 830 | | |
| | Disagree or others | 46 | 66 | 159 | | | 92 | 108 | 317 | | |

TABLE 4. Correlation Analysis of COSR (n = 27,493)

| Variable | Rank | How Do You Like the Role of Spontaneous Reports in This Program? | | | | | | | | | |
|--|-----------------------|--|-----------|---------------------|----------------------|----------|----------|-----------|---------------------|----------------------|----------|
| | | Medical Staffs | | | | | Patients | | | | |
| | | Helpful | Essential | Unhelpful or Others | <i>r_s</i> | <i>P</i> | Helpful | Essential | Unhelpful or Others | <i>r_s</i> | <i>P</i> |
| How much do you know about patient safety? | Very well | 5272 | 2139 | 272 | 0.174 | <0.01 | 2446 | 462 | 105 | 0.265 | <0.01 |
| | A little | 2388 | 1809 | 239 | | | 4327 | 2967 | 437 | | |
| | Do not know or others | 149 | 169 | 85 | | | 1823 | 1781 | 623 | | |
| Do you agree on the 3 principles? | Agree | 7194 | 2424 | 190 | 0.452 | <0.01 | 7617 | 2904 | 389 | 0.439 | <0.01 |
| | Partly agree | 593 | 1587 | 263 | | | 929 | 2156 | 459 | | |
| | Disagree or others | 22 | 106 | 143 | | | 50 | 150 | 317 | | |

situations among 27,493 participants. A total of 10,773 (39.2%) participants declared that they knew about patient safety very well. Within this group, 8588 (79.7%) participants regarded patients as an essential part of patient safety, and the participants who viewed patients as not essential or unhelpful in the Patients for Patient Safety program were accounted for 14.7% and 5.5%, respectively.

Among the participants who regarded patients as an essential part of patient safety, 80.6% (6919) also valued spontaneous reports highly. Of those who attached importance to spontaneous reports, 95.4% (6604) agreed on the principles of voluntariness, anonymity, and nonpunishment of the reporter. Of the participants who agreed on the principles, 82.9% (5477) were willing to report the safety events or potential danger voluntarily. Overall, the number of participants who were satisfied with all the 5 factors was 5477, accounting for 19.9% of all the 27,493 participants, as shown in Figure 2.

Correlation Analysis of Willingness to Report Adverse Events or Potential Danger

Correlation analysis of COPP is shown in Table 3. In both 2 groups of medical staffs and patients, a positive correlation was observed between the COPP and other factors including ROPS (medical staffs versus patients, *r_s* = 0.157 versus *r_s* = 0.216; both, *P* < 0.01), COSR (medical staffs versus patients, *r_s* = 0.410 versus *r_s* = 0.460; both, *P* < 0.01), and ATP (medical staffs versus patients, *r_s* = 0.356 versus *r_s* = 0.360; both, *P* < 0.01).

Table 4 indicates that the COSR had a positive correlation with ROPS (medical staffs versus patients, *r_s* = 0.174 versus *r_s* = 0.265; both, *P* < 0.01) and ATP (medical staffs versus patients, *r_s* = 0.452 versus *r_s* = 0.439; both, *P* < 0.01), which means participants with

better ROPS and acceptance of reporting principles thought more highly of spontaneous reports in patient safety.

Table 5 indicates the correlation between ROPS and other 2 factors, including WTP and ATP. Participants with higher ROPS had a higher tendency to support the 3 principles (medical staffs versus patients, *r_s* = 0.189 versus *r_s* = 0.183; both, *P* < 0.01) and participate in the report (medical staffs versus patients, *r_s* = 0.194 versus *r_s* = 0.209; both, *P* < 0.01).

Table 6 displays the correlation between WTP and other factors, including COPP, COSR, and ATP. In both groups of medical staffs and patients, higher WTP was observed among participants with positive attitudes toward patient participation (medical staffs versus patients, *r_s* = 0.267 versus *r_s* = 0.306; both, *P* < 0.01), spontaneous reports (medical staffs versus patients, *r_s* = 0.370 versus *r_s* = 0.358; both, *P* < 0.01), and reporting principles (medical staffs versus patients, *r_s* = 0.355 versus *r_s* = 0.361; both, *P* < 0.01). Figures 3 and 4 show the results of correlation analysis between medical staff and patients' WTP in patient safety reports, so that the analysis can be compared more intuitively.

DISCUSSION

Constructing a reporting system is a necessary measure to promote patient safety. The system to collect, analyze, issue information, and make recommendations has been applied in many countries and regions.⁷ However, the reporting rate was at a low level because of a lack of medical knowledge,¹¹ misunderstanding in the reporting process,¹² worries about privacy issues, and complicated reporting procedures.¹³⁻¹⁵ This study illustrated the attitudes toward the reporting system among licensed doctors,

TABLE 5. Correlation Analysis of ROPS (n = 27,493)

| Variable | Rank | How Much Do You Know About the Patient Safety? | | | | | | | | | |
|---|--------------------------|--|----------|--------------|----------------------|----------|-----------|----------|--------------|----------------------|----------|
| | | Medical Staffs | | | | | Patients | | | | |
| | | Very Well | A Little | No or Others | <i>r_s</i> | <i>P</i> | Very Well | A Little | No or Others | <i>r_s</i> | <i>P</i> |
| Do you agree on the 3 principles? | Very well | 6465 | 3129 | 214 | 0.189 | <0.01 | 2644 | 5559 | 2707 | 0.183 | <0.01 |
| | A little | 1114 | 1202 | 127 | | | 316 | 2016 | 1212 | | |
| | Do not know or others | 104 | 105 | 62 | | | 53 | 156 | 308 | | |
| Would you like to report the safety events or potential danger voluntarily? | Yes | 5032 | 2105 | 151 | 0.194 | <0.01 | 2388 | 3949 | 2001 | 0.209 | <0.01 |
| | Under certain conditions | 2535 | 2203 | 203 | | | 581 | 3594 | 1951 | | |
| | No or others | 116 | 128 | 49 | | | 44 | 188 | 275 | | |

TABLE 6. Correlation Analysis of the WTP (n = 27,493)

| Variable | Rank | Would You Like to Report the Safety Events or Potential Danger Voluntarily? | | | | | | | | | |
|--|---------------------|---|--------------------------|--------------|-------|-------|----------|--------------------------|--------------|-------|-------|
| | | Medical Staffs | | | | | Patients | | | | |
| | | Yes | Under Certain Conditions | No or Others | r_s | P | Yes | Under Certain Conditions | No or Others | r_s | P |
| How do you like the role of patients in this program? | Helpful | 6096 | 3128 | 93 | 0.267 | <0.01 | 6448 | 3171 | 108 | 0.306 | <0.01 |
| | Not essential | 884 | 1258 | 73 | | | 1164 | 1833 | 123 | | |
| | Unhelpful or others | 308 | 555 | 127 | | | 726 | 1122 | 276 | | |
| How do you like the role of spontaneous reports in this program? | Helpful | 5609 | 2146 | 54 | 0.370 | <0.01 | 6036 | 2478 | 82 | 0.358 | <0.01 |
| | Not essential | 1532 | 2459 | 126 | | | 1969 | 3050 | 191 | | |
| | Unhelpful or others | 147 | 336 | 113 | | | 333 | 598 | 234 | | |
| Do you agree on the 3 principles? | Agree | 6574 | 3142 | 92 | 0.355 | <0.01 | 7203 | 3560 | 147 | 0.361 | <0.01 |
| | Partially agree | 666 | 1657 | 120 | | | 1040 | 2322 | 182 | | |
| | Disagree or others | 48 | 142 | 81 | | | 95 | 244 | 178 | | |

licensed nurses, patients, and their next-of-kin, to make recommendations for further optimization of the system in China.

Of all the participants who knew about patient safety, 79.7% regarded patient participation as an important part of patient safety programs, and 80.6% of the participants who thought highly of patient participation regarded spontaneous reports as an essential component to promote patient safety. Of those who attached importance to spontaneous reports, 95.4% chose to agree on the principles of voluntariness, anonymity, and nonpunishment of the reporter. Of the participants who agreed on the principles,

82.9% showed a positive attitude toward the WTP in safety reports. The awareness of patient safety may influence the choices of the other questions step by step and may affect their voluntariness for safety reports ultimately. Thus, citizens who have a better understanding of patient safety show a higher WTP, whereas citizens who have less knowledge of patient safety are less likely to participate in safety reports. A previous study also pointed out that insufficient recognition could also negatively affect their attitudes and hinder their willingness to report.¹⁶ Therefore, administrators in medical institutions should popularize the

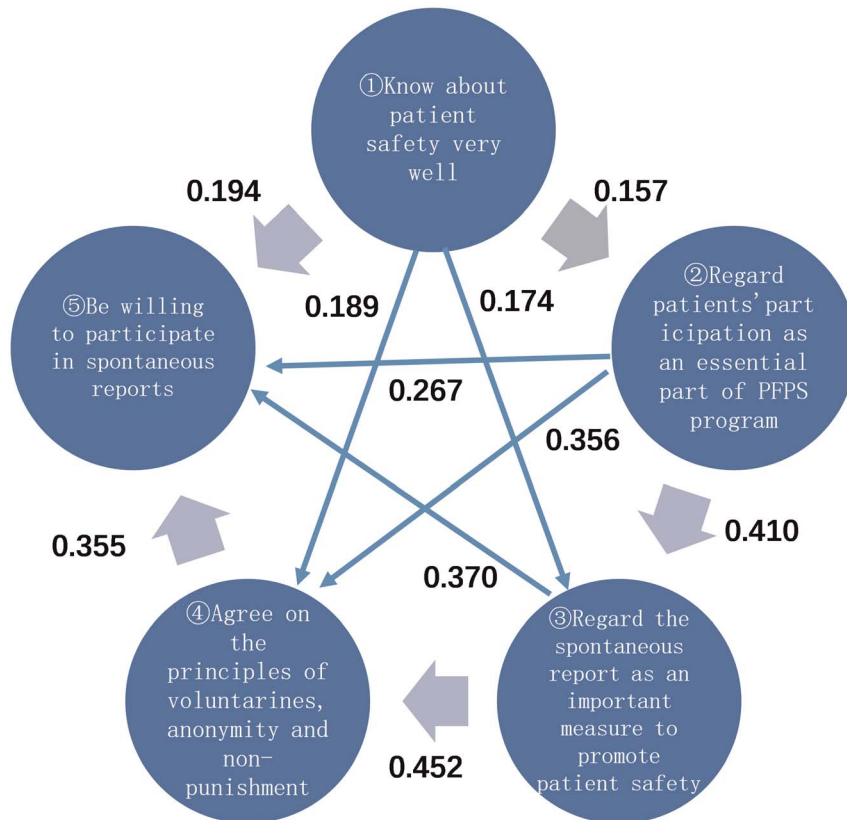


FIGURE 3. Correlation analysis results of medical staff's WTP in patient safety report. ① signifies direct association ② → signifies indirect association.

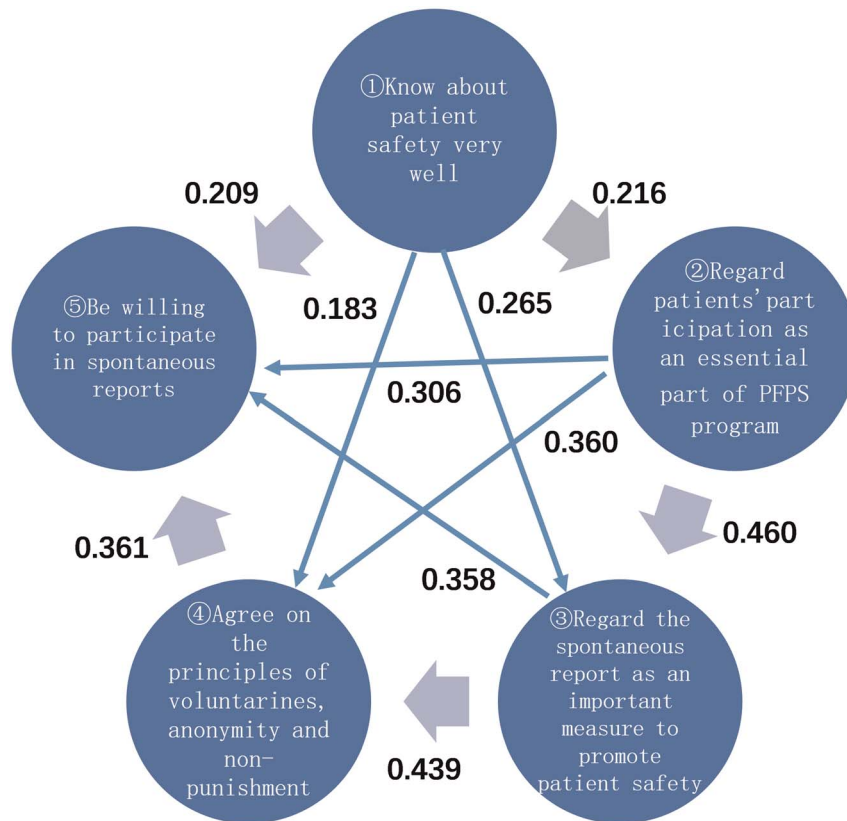


FIGURE 4. Correlation analysis results of patients' WTP in patient safety report. ① signifies direct association / ② → signifies indirect association.

knowledge of patient safety to medical staffs and patients, including the basic concept of patient safety, the potential danger of adverse events, the significance of safety reports, and detailed operating procedures.¹²

A reporting system following the principles of voluntariness, anonymity, and nonpunishment of the reporter can stimulate the public, especially medical staffs, to report rather than the one following the principles of coerciveness, publicity, and punishment. Previous studies indicated that most medical staffs would refuse to report adverse events or medical malpractice caused by themselves or their colleagues, for fear of dispute or punishment.¹⁷ Nowadays, the atmosphere of punishment hinders the enthusiasm of medical staffs and the development of the reporting system.¹⁸ Based on this, we analyzed the reasons for the low reporting rate

of the voluntary patient safety reporting system, as shown in Figure 5. Therefore, the principles of voluntariness, anonymity, and nonpunishment of the reporter should be emphasized in the construction of such a system.

Accordingly, we propose several suggestions on the optimization of the reporting system of patient safety.

First, the ROPS should be improved through public education and guidance from medical institutions. Publicity of relevant concept may contribute to the establishment of a comprehensive and practical system with active individual participation. Adverse that which did not cause substantial damage to patients might be ignored by medical staffs because of their misunderstanding of relevant knowledge, which may largely reduce the number of reports.¹⁹ Therefore, educational measures to medical staffs

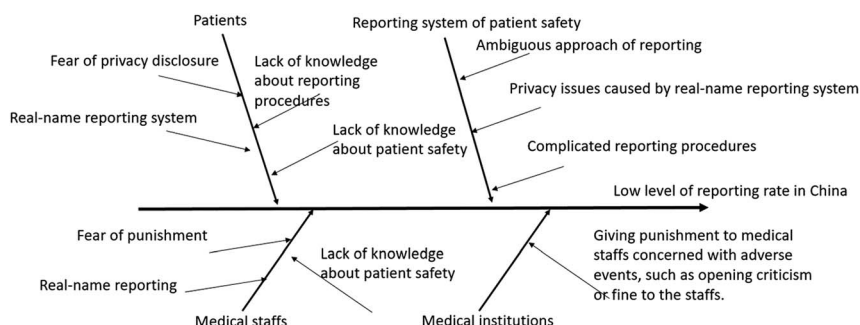


FIGURE 5. Analysis of reporting rate of patient safety at low level based on results.

TABLE 7. Suggestions on the Optimization of the Reporting System

| Problems on Patients | Problems on Medical Staffs | Suggestions |
|--|---|--|
| Lack of medical knowledge | Misunderstanding in patient safety | Improve the ROPS through public education and guidance |
| Real-name reporting | Fear of punishment | Build a well-designed and applicable system with anonymous options and stop punishment |
| Worries about privacy issues | Fear of dispute or unemployment | |
| Lack of reporting initiative | Fear of punishment from medical institutions | Build proper incentive mechanism for the construction of patient safety programs |
| | Lack of reporting initiative | |
| Unsure of reporting approaches | Unsure of reporting approaches | |
| Complicated reporting procedures | Complicated reporting procedures | Simplify reporting procedure with a structural questionnaire |
| Miswriting due to limited medical knowledge and low compliance to the reporting guidelines | Many words to fill in the blanks and high frequency of miswriting | |
| Incomplete sharing policy limited to a certain medical institution | | Construct a joint and standard reporting network and give timely feedback |
| Lack of feedback system to patients and medical staffs | | |

should also be taken to improve the present situation.⁸ By this way, medical staffs can have a thorough understanding of the definition and classification of patient safety, the operating procedures, and the significance of the reporting system. With better comprehension in patient safety and wider participation in this program, the harm to patients can be reduced to a large extent.⁵

Second, it is necessary to build a well-designed and applicable system with anonymous options.¹⁶ Anonymity can eliminate the reporter’s concerns and protect the reporter, thereby encouraging their extensive and effective participation.^{20,21} It is recommended that all medical institutions follow the “nonpunishment of the reporter” principle, formulate a system for reporting adverse events without penalty, and encourage medical personnel to report adverse events in a timely and effective manner. Creating a “non-punitive” patient safety culture can help eliminate the fear that medical staff will dare not report because of punishment. If the public concentrates on the events rather than the subsequent punishment, a more favorable atmosphere of patient safety can be created to prevent adverse events.²²

Third, the incentive systems should be built, whereas the punitive measures should be stopped. The incentive mechanisms have become a main driving force in the growth of spontaneous reports and an essential part to assure patient safety. Therefore, administrators in medical institutions should reward the medical staffs for their

timely reports and constructive proposals through moral encouragement or material reward. Moreover, a blanket exemption should be given to those who reported adverse events of their own.²³

It is also of great importance to simplify the reporting procedures with the structural questionnaire. The reporting content in the system can be added with a structural option for adverse events. When reporting, select according to the classification items listed on the form, and the information system will automatically display the corresponding category of the form. Most of the content of the report content can be completed by ticking, so as to reduce the pressure of the reporter’s text input and the probability of wrong filling and to improve the compliance of the report.²⁴ At the same time, the necessary text description space can supplement the details and specific contents of adverse events and help us better understand the process of events. The personal information of medical staffs or patients could be automatically withdrawn from electronic medical record with informed consent if needed.²⁵

Finally, a joint and standard reporting network should be constructed in China to unify the separate operating system in local medical institutions. The reporting system should be applicable and compatible, to satisfy the needs of information exchange in different regions and institutions²⁶; only in this way can we integrate the events and give timely feedback to medical staffs and patients.²⁴ Retrospective and prospective study can be conducted based on the collected data, to integrate the events, carry out multicenter research, and provide better medical service to medical staffs and patients.

We combined Table 7 with the reasons for the low reporting rate of the voluntary patient safety reporting system to provide recommendations for the optimization of the reporting system.

Highlights

1. This study breaks through the previous researchers’ work that only focused on the influencing factors of patient safety issues or adverse event reports in one or several medical institutions, but through the new media of WeChat public platform. The netizens participating in the survey are voluntarily, and the sample size is sufficient, which can reflect the public’s attitude toward the patient’s safety awareness and participation attitude in new information era.
2. This study found the attitudes toward patient safety among medical staffs and patients and gave suggestions in their perspectives for the optimization of a patient safety reporting system.

Limitations

This study used the WeChat public platform method to investigate and did not cover the public who did not use the WeChat public platform and or not pay attention to the public platform of the medical management center, so that this study has certain selective bias.

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