Research Article

Analysis of Factors Influencing Safety Attitudes of Operating Room Nurses and Their Cognition and Attitudes toward Adverse Event Reporting

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Operating room nurses play a critical role in patient safety. The evaluation of safety attitudes of operating room nurses reflects their awareness and belief of patient safety. Currently, however, the research on the safety attitudes of operating room nurses is hard to track in the existing literature in China. Therefore, this paper was conducted to explore the factors influencing the safety attitudes of operating room nurses and their cognition and attitudes toward adverse event reporting. A total of 711 operating room nurses from 16 tertiary hospitals in Sichuan Province from March 1, 2018, to 2019 were selected. The general information of operating room nurses, such as age, gender, and years of service in the operating room, was obtained through the basic information questionnaire. The Chinese version of the Safety Attitudes Questionnaire (C-SAQ) was used to evaluate the safety attitude of operating room nurses, and the cognition and attitude of the subjects to adverse event reports were assessed through the questionnaire of cognition and attitude toward adverse event reporting. The average score of safety attitudes of operating room nurses was 4.20 ± 0.49. The two dimensions with a lower positive reaction rate of the safety attitudes of operating room nurses were stress recognition and working conditions. The main factors affecting the safety attitude of operating room nurses were night shifts, as well as cognition and attitudes toward adverse event reporting. There was a positive correlation between the total score of C-SAQ and the total score of cognition and attitudes toward adverse event reporting (P < 0.01, r = 0.445). The safety attitude of operating room nurses is at the upper-middle level, but the stress recognition and working conditions need to be improved. Through the allocation of nursing human resources, the strengthening of hospital logistics support, and the establishment of nonpunitive nursing adverse event reporting system, the operating room safety can be significantly enhanced.

1. Introduction

According to the report Patient Safety 2030 published by the National Institute for Health Research, the failure to ensure patient safety is a major problem while providing health services [1]. The WHO reports that approximately 134 million adverse events and 2.6 million associated deaths occur each year in low-income and middle-income countries due to unsafe medical environments provided by hospitals [2]. In addition, the promotion and application of the WHO Surgical Safety Checklist (2008) are significant; however, recent studies demonstrated that the Surgical Safety Checklist is only partially implemented in many hospitals [3, 4]. In Greek, medical personnel believe that surgical safety is important; however, there is a big cognitive gap in the implementation of responsibilities and standardized procedures [5]. Related studies in China have reported some safety issues, such as surgical site errors, gauze left in patients, and other serious medical malpractice. In 2019, a pregnant woman in Panzhihua City, Sichuan Province, died.
of three gauze pieces left in her abdomen after a cesarean section, which caused nurses in the operating room to reflect on patient safety. Therefore, it is of great practical significance to study the influencing factors of operating room safety accidents and analyze the attitude of operating room nurses for preventing errors and improving patient safety.

A number of studies have shown that medical staff’s awareness of safety culture is closely related to clinical adverse events [6–8]. The key to maintaining patient safety lies in establishing a safety culture. Murray et al. pointed out that the medical staff’s safety attitudes toward patients are vital in the patient safety culture, and improved medical staff’s attitudes to patient safety promote patient health and safety [9]. Haugen et al. also proposed that the attitude and behavior of the surgical team reflected the development of safety procedures in the operating room [10]. On the other hand, reporting and analyzing adverse events is key to improving patient safety, which can not only make medical staff consciously avoid surgical errors but also improve the safety of the whole system [11]. Operating room nurses have frequent contact with patients, which is the first defense line to ensure patient safety. Therefore, to construct a safe operating room organizational culture, it is necessary to understand the status quo of operating room nurses’ safety attitudes as well as their cognition and attitudes toward adverse event reporting, so as to make targeted improvements to improve their behavior with the safety culture. In recent years, the tertiary grade A hospitals in China are favored by patients, and the number of operations is increasing year by year. However, the problem of operation safety has become increasingly prominent. The assessment of operating room nurses’ safety attitudes and their cognition and attitudes toward adverse event reporting can reflect their perception of patient safety and faith. However, only a few studies have addressed the safety culture of operating room nurses in China. Therefore, the present study aimed to investigate the safety attitude of operating room nurses from 16 tertiary hospitals in Sichuan Province, China, and explore whether the social demographic factors and operating room nurses' cognition and attitudes toward adverse event reporting have an impact on patient safety.

2. Materials and Methods

2.1. Research Design. This cross-sectional survey was conducted from March 1, 2018 to 2019. The survey participants were operating room nurses across 16 tertiary hospitals in Sichuan Province who met the inclusion and exclusion criteria and were assimilated by the convenience sampling method. The paper participants were aware of the background and purpose of the paper. All participants in this paper provided informed consent. Inclusion criteria were as follows: voluntary participants; those who had obtained the nurse qualification certificate and were registered; those who had worked in the operating room of the inpatient department of a medical institution for ≥ 1 year. Exclusion criteria were as follows: those who were on leave; those who had worked in the operating room of the inpatient department of a medical institution for ≥ 1 year. Exclusion criteria were as follows: those who were on leave; those who were to go abroad for further study; those who were in other hospitals. Elimination criteria were as follows: those who dropped out of the study; those questionnaires with missing value >20%.

2.2. Research Tool. The questionnaire included 12 items of age, gender, length of service in the operating room, mode of employment, initial education, final education, position, professional title, marital status, night shifts, weekly overtime hours, and adverse events reported in the past year.

The C-SAQ was translated and revised by Guo Xia of Shanxi Medical University in 2009 according to the general version of SAQ [12]. The Cronbach's $\alpha$ coefficient of each dimension was 0.72–0.85, and the overall value was 0.88, with adequate reliability and validity. The revised scale consists of 6 dimensions, which are teamwork climate, safety climate, perceptions of management, job satisfaction, working conditions, and stress recognition, with 31 items in total. The five grades of the Likert scale were as follows: 1 = strongly disagree, 2 = slightly disagree, 3 = neutral, 4 = slightly agree, and 5 = strongly agree. Among these, 6, 13, 28, 29, 30, and 31 were negative entries, with inverted scores. Each item was assigned a value of 1–5 points, and the total score of the scale was 31–155 points; the higher the score, the more positive the safety attitude.

The Reporting of Clinical Adverse Events Scale was designed by Wilson et al. [13] and introduced by Nanjing University of traditional Chinese medicine in 2012. It was adopted and translated into a questionnaire suitable for China. Cronbach’s $\alpha$ coefficient of the questionnaire was 0.8484. It covers 5 dimensions of perceived blame, perceived criteria for identifying events that should be reported, perceptions of colleagues’ expectations, perceived benefits of reporting, and perceived clarity of reporting procedures, with a total of 28 items (14 positive and 14 negative items). The scale uses the Likert scale as follows: proficiency = 5, familiarity = 4, understanding = 3, being clear = 2, not knowing = 1, strongly agree = 5, agree = 4, neutral = 3, disagree = 2, strongly disagree = 1; the negative items were scored in reverse. The total score of the scale was the sum of the items, i.e., 28–140. The higher the score, the better the research participants’ awareness of adverse event reports, the more positive their attitudes, and the more positive their intention to implement.

3. Proposed Methods

3.1. Estimation of Sample Size. The sample size was 5–10-fold of the scale items. In this paper, 31 items comprised the C-SAQ and 28 items in the adverse event report cognition and attitude questionnaire. In order to make the sample size representative, we selected 590 cases (10 times of the scale items), but considering the incomplete or missing responses in the questionnaire, the sample size was expanded by 20% to 708 cases.

3.2. Preinvestigation. The number of people being investigated was determined by at least 5% of the sample size ($590 \times 5\% = 30$ cases). In February 2018, 40 nurses meeting
the inclusion criteria were selected in the operating room of the inpatient department of a tertiary hospital for a pre-survey. Two weeks later, the internal consistency and test-retest reliability of the research tools were calculated. According to the results of the presurvey and the problems encountered, the descriptions of some items in the questionnaires were adjusted and modified, and expert opinions were solicited to form the final version of the questionnaires. The pre-investigation revealed that Cronbach’s coefficient of the C-SAQ used in this paper was 0.89, the test-retest reliability was 0.90, and Cronbach’s coefficient and test-retest reliability of adverse event reporting cognition and attitude questionnaire were 0.86 and 0.87, respectively.

3.3. Data Collection and Sorting. The investigator communicated with the head nurse of the operating room of the tertiary class A hospitals in advance by telephone and then distributed the questionnaires to the participants in each hospital at the agreed time. In the morning class meeting, the following parameters were considered: the research purpose, inclusion and exclusion criteria, matters needing attention when filling out the questionnaire, confidentiality commitment to the survey data, and informed consent. The researcher handed out the questionnaires to the nurses on the spot. The time for filling out the questionnaires was 15–20 min. The nurse filled out the questionnaires anonymously and put them in a recycling box, from where the researcher retrieved them.

3.4. Quality Control. After consulting relevant literature, resurvey, and experts, the first drafts of the questionnaires were set and modified. The words used were accurate and standardized to ensure that the respondents could understand the contents accurately and reduce the possibility of wrong and random answers. Each returned questionnaire was classified and numbered, and the questionnaires with the same option and more than 3 missing items were excluded. In the data entry stage, logic error checking was carried out to ensure the accuracy of the data.

3.5. Research Ethics. This paper was approved by the Ethics Committee and Hospital Management of West China Hospital, West China Second Hospital, West China Stomatological Hospital, West China Fourth Hospital, Army General Hospital, Chengdu Third People’s Hospital, Chengdu Orthopedic Hospital, Chengdu University of Traditional Chinese Medicine Affiliated Hospital, Chengdu Hospital of Integrated Traditional Chinese and Western Medicine, Sichuan Cancer Hospital, Chengdu University Hospital, Wenjiang Fifth People’s Hospital, Chengdu Women and Children’s Central Hospital, Chengdu Second Hospital, and West China Hospital Shangjin Branch Hospital (No. 153). The present study described the research participants, and the consent of the investigation was obtained, which was in line with the principle of voluntary harmlessness. In this paper, the general personal data of the respondents were confidential and filled in anonymously. The results were limited to this paper, and no other interests were involved.

3.6. Statistical Analysis. EpiData3.1 was used to establish a database for all the collected data, and SPSS17.0 software was used for statistical analysis. For the general information of operating room nurses, enumeration data were described by frequencies (percentages), and measurement data were presented as mean ± standard deviation. The score of C-SAQ was described by mean ± SD. The positive response rate of each dimension or item was equal to the number of positive responses/the total number of responses. Positive items such as "slightly agree" and "strongly agree" were counted as positive responses, while the reverse items were opposite; "disagree" and "strongly disagree" were counted as negative responses. For the analysis of the general situation of safety attitudes of operating room nurses, a one-way analysis of variance (ANOVA) or two-sample t-test was used. Pearson’s correlation test was used to analyze the correlation between C-SAQ score and adverse event reporting cognition and attitude score. Multiple linear regression analysis was used to explore the factors influencing the safety attitudes of operating room nurses. The entry standard was 0.05, and the exclusion standard was 0.10. $P < 0.05$ was considered statistically significant.

4. Experimental Results and Analysis

In this paper, 755 cases were investigated, among which 711 were effective samples. The recovery rate of the questionnaires was 94.2%. The general information of the 711 operating room nurses is summarized in Table 1.

The total average score of C-SAQ of the operating room nurses was 4.20 ± 0.49, and the overall positive response rate was 80.55%, which was in the upper-middle level. The scores of each dimension from high to low were perceptions of management, job satisfaction, safety climate, teamwork climate, stress recognition, and working conditions. Perceptions of management, job satisfaction, safety climate, and teamwork climate with a positive response rate >80% were considered as advantageous dimensions, while stress recognition and working conditions with a positive response rate <80% were considered as the dimensions to be improved. Table 2 is the total score and scores of various dimensions of safety attitudes of operating room nurses. Table 3 is the positive response rate of each item of safety attitudes of operating room nurses.

As shown in Table 4, the score of teamwork climate varied in nurses with different positions, night shifts (with or without), and weekly overtime hours ($P < 0.05$). Also, significant differences were detected in the scores of safety climate and perceptions of management among nurses of different ages, positions, and night shifts (with or without) ($P < 0.05$). Significant differences were observed in the scores of job satisfaction among nurses in different age groups, length of service in operating room, and positions ($P < 0.05$). As shown in Table 5, the total score of C-SAQ is positively
correlated with the total score of cognition and attitudes toward adverse event reporting ($P < 0.01$, $r = 0.445$). Multiple linear regression analysis was conducted with the total score of safety attitudes of operating room nurses as the dependent variable, the general information of operating room nurses, and the total score of their cognition and attitudes toward adverse event reporting as independent variables. Table 6 shows the independent variable assignment of factors influencing the C-SAQ of operating room nurses. The results showed that night shifts, awareness, and attitude toward adverse event reporting were the main influencing factors of safety attitudes of operating room nurses ($P < 0.05$). Table 7 presents multiple linear stepwise regression analysis of safety attitudes of operating room nurses.

This paper described the safety attitude of the operating room nurses from 16 tertiary class A hospitals in Sichuan Province, China. The results showed that the nurses in the operating room had a positive attitude toward safety. The cognition and attitudes toward night shifts and adverse event

| Table 1: Survey results of general information of operating room nurses ($n = 711$). |
|---------------------------------------------------------------|
| Variables                                      | Number of people | Constituent ratio (%) |
| Age (year)                                      |                  |                      |
| $\leq 25$                                       | 174              | 24.5                |
| 26–35                                          | 380              | 53.4                |
| 36–45                                          | 96               | 13.5                |
| $>45$                                          | 61               | 8.6                 |
| Gender                                         |                  |                      |
| Male                                           | 53               | 7.5                 |
| Female                                         | 658              | 92.5                |
| Length of service in the operating room (year)   |                  |                      |
| $\leq 3$                                       | 202              | 28.4                |
| 4–10                                          | 278              | 39.1                |
| $>10$                                         | 231              | 32.5                |
| Mode of employment                              |                  |                      |
| Contract system                                 | 497              | 69.9                |
| Fixed establishment                             | 214              | 30.1                |
| Initial education                               |                  |                      |
| Secondary specialized school                    | 265              | 37.3                |
| Junior college                                  | 307              | 43.2                |
| Bachelor degree or above                        | 139              | 19.5                |
| Final education                                 |                  |                      |
| Secondary specialized school                    | 15               | 2.1                 |
| Junior college                                  | 226              | 31.8                |
| Bachelor degree or above                        | 470              | 66.1                |
| Post                                           |                  |                      |
| Nurse                                          | 556              | 78.2                |
| Teaching teacher                                | 125              | 17.6                |
| Head nurse and above                            | 30               | 4.2                 |
| Professional ranks and titles                   |                  |                      |
| Nurse                                          | 207              | 29.1                |
| Nurse practitioner                              | 332              | 46.7                |
| Nurse in charge                                 | 157              | 22.1                |
| Deputy chief nurse and above                    | 15               | 2.1                 |
| Marital status                                  |                  |                      |
| Unmarried                                       | 253              | 35.6                |
| Married                                         | 448              | 63                  |
| Divorce or separation                           | 10               | 1.4                 |
| Night shifts                                    |                  |                      |
| Yes                                            | 477              | 67.1                |
| No                                             | 234              | 32.9                |
| Weekly overtime hours (h)                       |                  |                      |
| No overtime                                     | 110              | 15.5                |
| $\leq 5$                                       | 226              | 31.8                |
| 6–10                                          | 208              | 29.2                |
| $>10$                                         | 167              | 23.5                |
| Adverse events reported in the past year        |                  |                      |
| Yes                                            | 274              | 38.5                |
| No                                             | 437              | 61.5                |
reporting were the main influencing factors of the safety attitude of operating room nurses.

The results of this paper showed that the positive reaction rate of the total score of operating room nurses’ safety attitudes was >80%, indicating that the operating room nurses of tertiary class A hospitals had a positive safety culture, which was similar to those of previously reported studies conducted in Turkey [11, 14]. Patient safety is a common concern of global healthcare. While hospital managers are concerned about patient safety, health departments worldwide have been committed to continuously enhancing patient safety. Armutlu et al. [15] believe that hospital managers play a major role in creating and developing a safety culture and climate. At present, patient...

| Dimension                                      | Total score | Total average score | Average score of all items | Positive response rate (%) |
|------------------------------------------------|-------------|---------------------|----------------------------|----------------------------|
| Teamwork climate (items 1–6)                  | 30          | 25.25 ± 3.34        | 4.21 ± 0.56                | 81.95                      |
| Safety climate (items 7–13)                   | 35          | 29.69 ± 4.19        | 4.24 ± 0.60                | 82.98                      |
| Perceptions of management (items 14–17)       | 20          | 17.68 ± 2.78        | 4.42 ± 0.69                | 87.03                      |
| Job satisfaction (items 18–22)                | 25          | 21.38 ± 3.87        | 4.28 ± 0.77                | 83.46                      |
| Working conditions (items 23–27)              | 25          | 19.87 ± 3.65        | 3.97 ± 0.73                | 74.04                      |
| Stress recognition (items 28–31)              | 20          | 16.19 ± 4.13        | 4.05 ± 1.03                | 78.20                      |
| Total score                                    | 155         | 130.05 ± 15.27      | 4.20 ± 0.49                | 80.55                      |

Table 2: Total score and scores of various dimensions of safety attitudes of operating room nurses (n = 711).

| Item   | Content                                                                 | Positive responders (n) | Positive response rate (%) | Rank |
|--------|-------------------------------------------------------------------------|-------------------------|----------------------------|------|
| 14     | Patient safety is the top priority in this clinical area management.    | 674                     | 94.80                      | 1    |
| 10     | I know the proper channels to direct questions regarding patient safety in this clinical area. | 672                     | 94.51                      | 2    |
| 4      | I have the support I need from other personnel to care for patients.    | 670                     | 94.23                      | 3    |
| 5      | It is easy for personnel here to ask questions when there is something that they do not understand. | 666                     | 93.67                      | 4    |
| 2      | Disagreements in this clinical area are resolved appropriately (i.e., not who is right, but what is best for the patient). | 643                     | 90.44                      | 5    |
| 9      | Medical errors are handled appropriately in this clinical area.         | 639                     | 89.87                      | 6    |
| 19     | Working here is like being part of a large family.                     | 631                     | 88.75                      | 7    |
| 12     | I would feel safe being treated here as a patient.                     | 623                     | 87.62                      | 8    |
| 8      | The culture in this clinical area makes it easy to learn from the errors of others. | 621                     | 87.34                      | 9    |
| 31     | I am less effective at work when fatigued.                             | 616                     | 86.64                      | 10   |
| 24     | This department does a good job of training new personnel.             | 615                     | 86.50                      | 11   |
| 15     | Management supports my daily efforts.                                   | 614                     | 86.36                      | 12   |
| 7      | I am encouraged by my colleagues to report any patient safety concerns I may have. | 611                     | 85.94                      | 13   |
| 21     | I like my job.                                                         | 602                     | 84.67                      | 14   |
| 25     | Trainees in my discipline are adequately supervised.                   | 597                     | 83.97                      | 15   |
| 18     | I am proud to work in this clinical area.                              | 596                     | 83.83                      | 16   |
| 16     | I get adequate, timely info about events that might affect my work.    | 595                     | 83.68                      | 17   |
| 17     | This is a good place to work.                                          | 592                     | 83.26                      | 18   |
| 20     | Morale in this clinical area is high.                                  | 586                     | 82.42                      | 19   |
| 26     | Problem personnel are dealt with constructively by our department.     | 586                     | 82.42                      | 20   |
| 1      | The physicians and nurses here work together as a well-coordinated team. | 585                     | 82.28                      | 21   |
| 30     | Fatigue impairs my performance during emergency situations (such as rescuing cardiac arrest patients). | 562                     | 79.04                      | 22   |
| 11     | I receive appropriate feedback about my performance.                   | 553                     | 77.78                      | 23   |
| 22     | All kinds of technical operation procedures are concise.              | 552                     | 77.64                      | 24   |
| 3      | The suggestions about safety would be acted upon if they were expressed to management. | 540                     | 75.95                      | 25   |
| 9      | I am more likely to make errors in tense or hostile situations.        | 531                     | 74.68                      | 26   |
| 28     | When my workload becomes excessive, my performance is impaired.        | 515                     | 72.43                      | 27   |
| 27     | The levels of staffing in this clinical area are sufficient to handle the number of patients. | 460                     | 64.70                      | 28   |
| 13     | In this clinical area, it is difficult to discuss errors.              | 411                     | 57.81                      | 29   |
| 6      | In this clinical area, it is difficult to speak up if I perceive a problem with patient care. | 392                     | 55.13                      | 30   |
| 23     | This clinical area has sufficient support from the logistics department. | 374                     | 52.60                      | 31   |

Table 3: Positive response rate of each item of safety attitudes of operating room nurses (n = 711).
| Variable group | Teamwork climate (mean ± SD) | Safety climate (mean ± SD) | Perceptions of management (mean ± SD) | Job satisfaction (mean ± SD) | Working conditions (mean ± SD) | Stress recognition (mean ± SD) | C-SAQ total score (mean ± SD) |
|---------------|-----------------------------|-----------------------------|--------------------------------------|-----------------------------|-------------------------------|-------------------------------|-------------------------------|
| Age (year)    |                             |                             |                                      |                             |                               |                               |                               |
| ≤25           | 25.29 ± 3.28                | 29.56 ± 3.82                | 17.85 ± 2.47                         | 21.94 ± 3.60                | 20.76 ± 3.50                  | 16.03 ± 4.10                  | 131.43 ± 14.38                |
| 26–35         | 25.07 ± 3.51                | 29.44 ± 4.53                | 17.43 ± 3.03                         | 20.99 ± 4.20                | 19.48 ± 3.76                  | 16.36 ± 4.12                  | 128.77 ± 16.54                |
| 36–45         | 25.52 ± 2.90                | 30.35 ± 3.62                | 17.91 ± 2.46                         | 21.48 ± 3.28                | 19.51 ± 3.36                  | 15.39 ± 4.68                  | 130.90 ± 12.18                |
| >45           | 25.84 ± 3.03                | 30.51 ± 3.73                | 18.36 ± 2.29                         | 22.11 ± 3.0                | 20.30 ± 3.32                  | 16.82 ± 3.14                  | 130.05 ± 13.02                |
| F             | 1.219                       | 2.08                        | 2.684                                 | 3.232                       | 5.603                         | 1.981                         | 2.677                         |
| P             | 0.302                       | 0.101                       | 0.046                                 | 0.022                       | 0.001                         | 0.115                         | 0.046                         |
| Length of service in the operating room |                             |                             |                                      |                             |                               |                               |                               |
| ≤3            | 25.31 ± 3.45                | 29.55 ± 4.05                | 17.89 ± 2.51                         | 21.96 ± 3.61                | 20.61 ± 3.50                  | 15.78 ± 4.11                  | 130.95 ± 15.24                |
| 4–10          | 25.09 ± 3.30                | 29.22 ± 4.40                | 17.46 ± 2.99                         | 21.01 ± 4.17                | 19.62 ± 3.72                  | 16.49 ± 4.15                  | 129.21 ± 16.13                |
| >10           | 25.39 ± 3.30                | 29.97 ± 4.05                | 17.79 ± 2.68                         | 21.38 ± 3.57                | 19.55 ± 3.58                  | 16.19 ± 4.11                  | 130.28 ± 15.27                |
| F             | 0.577                       | 0.782                       | 1.65                                  | 3.61                        | 5.67                          | 1.72                          | 0.794                         |
| P             | 0.562                       | 0.458                       | 0.194                                 | 0.027                       | 0.005                         | 0.179                         | 0.452                         |
| Mode of employment |                             |                             |                                      |                             |                               |                               |                               |
| Contract system |                             |                             |                                      |                             |                               |                               |                               |
| Fixed establishment |                             |                             |                                      |                             |                               |                               |                               |
| T             | 0.765                       | 0.758                       | –0.2                                 | 1.7                         | 2.66                          | ~2.41                         | 0.752                         |
| P             | 0.444                       | 0.448                       | 0.839                                 | 0.09                        | 0.008                         | 0.016                         | 0.452                         |
| Initial education |                             |                             |                                      |                             |                               |                               |                               |
| Secondary specialized school |                             |                             |                                      |                             |                               |                               |                               |
| Junior college Bachelor degree or above |                             |                             |                                      |                             |                               |                               |                               |
| F             | 1.485                       | 6.641                       | 2.672                                 | 2.855                       | 2.271                         | 1.369                         | 2.628                         |
| P             | 0.227                       | 0.001                       | 0.07                                  | 0.058                       | 0.104                         | 0.255                         | 0.073                         |
| Final education |                             |                             |                                      |                             |                               |                               |                               |
| Secondary specialized school |                             |                             |                                      |                             |                               |                               |                               |
| Junior college Bachelor degree or above |                             |                             |                                      |                             |                               |                               |                               |
| F             | 1.145                       | 0.385                       | 1.42                                  | 1.99                        | 3.82                          | 1.12                          | 1.13                          |
| P             | 0.319                       | 0.681                       | 0.243                                 | 0.137                       | 0.022                         | 0.326                         | 0.324                         |
| Post          |                             |                             |                                      |                             |                               |                               |                               |
| Nurse Teaching teacher |                             |                             |                                      |                             |                               |                               |                               |
| Head nurse and above |                             |                             |                                      |                             |                               |                               |                               |
| F             | 4.638                       | 3.846                       | 4.93                                  | 3.03                        | 2.53                          | 1.29                          | 4.667                         |
| P             | 0.01                        | 0.022                       | 0.007                                 | 0.049                       | 0.08                          | 0.277                         | 0.01                          |
| Professional ranks and titles |                             |                             |                                      |                             |                               |                               |                               |
| Nurse          | 25.31 ± 3.26                | 29.75 ± 4.07                | 17.88 ± 2.63                         | 21.98 ± 3.73                | 20.71 ± 3.42                  | 15.80 ± 3.97                  | 131.44 ± 15.23                |
| Nurse practitioner |                             |                             |                                      |                             |                               |                               |                               |
| Nurse in charge Deputy chief nurse and above |                             |                             |                                      |                             |                               |                               |                               |
| F             | 0.777                       | 0.556                       | 1.63                                  | 2.37                        | 5.51                          | 0.85                          | 1.116                         |
| P             | 0.507                       | 0.644                       | 0.181                                 | 0.07                        | 0.001                         | 0.467                         | 0.342                         |
| Marital status |                             |                             |                                      |                             |                               |                               |                               |
| Unmarried     | 25.46 ± 3.25                | 29.70 ± 4.05                | 17.77 ± 2.49                         | 21.67 ± 3.70                | 20.34 ± 3.57                  | 16.10 ± 4.02                  | 131.05 ± 13.96                |
Increasingly aware of safeguarding their rights. Moreover, the Internet has reduced the information inequality between doctors and patients, and the increase in patients’ complaints has also promoted the safety management of hospitals.

Evidence [18] has indicated that a positive response rate >80% is an advantage, a rate between 50 and 79% indicates a need for improvement, while a rate <50% suggests urgent improvement required. In this paper, the parameters with high positive reaction rates are teamwork climate, perceptions of management, and safety climate, which are consistent with the results of Yu et al. [19] and Ramos and Caligidig [8]. The domains to be improved in the safety attitude of operating room nurses were stress recognition and working conditions. The operating room is characterized by great pressure and a high workload. Today, the increasing operations in tertiary class A hospitals and the growing demand for nursing cooperation have led to increased susceptibility of operating room nurses to adverse work pressure reactions. The tense working environment causes a negative impact on the nurses and patients, which is manifested as an increased rate of infection or patient mortality [20]. Yalçın Akgul and Aksoy [21] showed that increased organizational stress of operating room staff may negatively affect their attitudes toward patient safety, suggesting that reducing the pressure of operating room staff may be conducive to improving patient safety. According to previous studies [22], a healthy working environment can improve nurses’ job satisfaction and reduce work pressure and fatigue, contributing to high-quality nursing. Also, it is suggested that managers should not ignore the negative influence of nursing staff on patient safety due to work pressure. Liu et al. [23] proposed that reasonable allocation and organizational support of nursing resources are directly related to improving patient safety. Therefore, we can reasonably allocate human resources, implement hierarchical management and postmanagement, and arrange the work of nurses according to their work experience, professional title, ability, and personality traits, so that they can relieve certain pressures through team cooperation and communication. On the other hand, psychological training can be conducted to improve nursing staff’s ability to adapt to pressure and help them to better manage and relieve pressure.

In the present study, the score of the working condition dimension was the lowest. It is shown that some operating room nurses in tertiary class A hospitals in China believe that the current human resource allocation is insufficient and there are potential safety hazards [24]. The correlation between nurse staffing and patient safety is evident. As nursing care increases, so does the risk, incidence rate, and even death rate of patients. Even if the overall allocation of nursing staff is adequate, the acceleration of patient turnover increases the risk of patient safety and death [25, 26]. According to a previous study in Holland [27], the role of nurses in clinical work, nursing behavior, and nursing autonomy are closely related to manpower allocation. Nurses differ from doctors in their role, clinical behavior, thinking mode, decision-making power, and information

### Table 4: Continued.

| Variable group         | Teamwork climate (mean ± SD) | Safety climate (mean ± SD) | Perceptions of management (mean ± SD) | Job satisfaction (mean ± SD) | Working conditions (mean ± SD) | Stress recognition (mean ± SD) | C-SAQ total score (mean ± SD) |
|------------------------|------------------------------|-----------------------------|---------------------------------------|-------------------------------|--------------------------------|-----------------------------|-------------------------------|
| Married                | 25.12 ± 3.33                 | 29.69 ± 4.18               | 17.65 ± 2.86                         | 21.22 ± 3.91                 | 19.61 ± 3.63                   | 16.25 ± 4.14                | 129.54 ± 15.46               |
| Divorce or separation  | 25.70 ± 5.48                 | 29.10 ± 7.52               | 16.40 ± 5.08                         | 21.10 ± 5.72                 | 19.70 ± 5.31                   | 15.60 ± 6.45                | 127.60 ± 32.04               |
| F                      | 0.92                         | 0.905                      | 0.297                                 | 0.325                        | 0.036                          | 0.813                       | 0.918                        |
| P                      | 0.399                        | 0.905                      |                                      |                               |                                |                             |                               |
| Night shifts            |                              |                             |                                      |                               |                                |                             |                               |
| No                     | 25.85 ± 3.05                 | 30.18 ± 3.99               | 18.15 ± 2.52                         | 21.19 ± 3.98                 | 19.81 ± 3.69                   | 16.25 ± 4.14                | 131.99 ± 14.58               |
| Yes                    | 24.95 ± 3.44                 | 29.44 ± 4.27               | 17.45 ± 2.87                         | 21.77 ± 3.60                 | 19.99 ± 3.55                   | 16.05 ± 4.12                | 129.10 ± 15.52               |
| t                      | 3.412                        | 2.204                      | 3.31                                 | −1.88                        | −0.64                          | 0.63                        | 2.383                        |
| F                      | 0.001                        | 0.028                      | 0.001                                 | 0.06                         | 0.522                          | 0.531                       | 0.017                        |
| Weekly overtime hours  |                              |                             |                                      |                               |                                |                             |                               |
| No overtime            | 25.18 ± 3.64                 | 29.22 ± 4.48               | 17.75 ± 2.90                         | 21.78 ± 3.97                 | 20.19 ± 3.53                   | 14.69 ± 4.64                | 128.82 ± 16.42               |
| ≤5                     | 25.05 ± 3.35                 | 29.63 ± 4.19               | 17.67 ± 2.87                         | 21.38 ± 3.76                 | 20.10 ± 3.63                   | 15.95 ± 3.93                | 129.78 ± 15.45               |
| 6–10                   | 24.97 ± 3.06                 | 29.48 ± 3.45               | 17.65 ± 2.45                         | 21.06 ± 3.67                 | 19.44 ± 3.34                   | 16.86 ± 4.19                | 129.46 ± 13.21               |
| >10                    | 25.90 ± 3.39                 | 30.32 ± 4.47               | 17.68 ± 2.97                         | 21.51 ± 4.17                 | 19.89 ± 4.07                   | 16.66 ± 3.68                | 131.96 ± 16.55               |
| F                      | 2.919                        | 1.931                      | 0.04                                 | 0.94                         | 1.54                           | 7.83                        | 1.237                        |
| P                      | 0.033                        | 0.123                      | 0.991                                | 0.421                        | 0.204                          | <0.001                      | 0.295                        |
Table 5: Correlation between C-SAQ and operating room nurses' cognition and attitudes toward adverse event reporting (r value).

| Project                          | Teamwork climate | Safety climate | Perceptions of management | Job satisfaction | Working conditions | Stress recognition | Report cognition | Implement intention | Department culture | Punishment environmental science | Administration expect | Total score of cognition and attitudes of adverse event reporting | C-saq total score |
|---------------------------------|------------------|---------------|---------------------------|------------------|-------------------|-------------------|-----------------|--------------------|-------------------|-----------------------------|---------------------|---------------------------------------------------------------|------------------|
|                                 | *P* = 0.001      |               |                           |                  |                   |                   |                 |                    |                   |                             |                     |                                                              |                  |
| C-SAQtotalscore                 | *P* = 0.001      |               |                           |                  |                   |                   |                 |                    |                   |                             |                     |                                                              |                  |
| Note. *P* < 0.05; **P < 0.01.   |                  |               |                           |                  |                   |                   |                 |                    |                   |                             |                     |                                                              |                  |
stimulate the enthusiasm of the nursing staff. Improvements in staffing, economic incentives can be used to support in the operating room. With the gradual increase in allocation of nursing staff and logistic, therefore, it is suggested that the managers should appropriately increase the allocation of nursing staff and logistic support in the operating room. With the gradual improvement of staffing, economic incentives can be used to stimulate the enthusiasm of the nursing staff.

In this paper, the median night shift and the cognition and attitudes toward adverse event reporting were the main factors influencing the safety attitude of operating room nurses. Night shift operating room nurses scored lower on patient safety attitudes than nonnight shift operating room nurses, which was similar to the research results of D’Oliveira and Anagnostopoulos and Roelen et al. [30, 31]. Nurses on night shifts have less manpower, great responsibility, and high risk, with irregular life and long-term sleep deprivation, which is susceptible to job burnout that affects personal health, memory, and mental function performance, leading to low safety attitude scores. In the United States, there is little variation in the number of day and night shifts in various departments of hospitals, and there are specialized night nurses [32]. Therefore, nursing managers should provide humanistic care for night shift nurses, arrange the night shifts scientifically and rationally, and employ an incentive mechanism to arouse the enthusiasm of night shift nurses, so as to provide 24-hour uninterrupted high-quality nursing for patients.

The cognition and attitudes of operating room nurses toward adverse event reporting and also the main factors influencing the safety attitude were positively correlated with operating room nurses’ safety attitudes. Relevant studies [8, 33] also showed a low reporting rate of adverse events by nurses. Atwal et al. [34] recommend that organizations with a strong patient safety culture adopt a positive attitude toward incident reporting. Nurses’ indecision in reporting adverse events might be related to a widespread culture of punitive responses and blame for errors. They fear being held accountable and punished by their superiors and are less motivated to report adverse events [8]. Although the WHO Surgical Safety Checklist can effectively improve the

Table 6: Independent variable assignment of factors influencing C-SAQ of operating room nurses.

| Research variables                                      | Assignment                                      |
|---------------------------------------------------------|-------------------------------------------------|
| Safety culture score                                    | Continuous variable                             |
| Age group                                               | 1 = ≤25 year, 2 = 26–35 year, 3 = 36–45 year, 4 ≥ 45 year |
| Length of service in the operating room                 | 1 = ≤3 year, 2 = 4–10 year, 3 ≥ 10 year         |
| Mode of employment                                      | 1 = Contract system, 2 = Fixed establishment    |
| Initial education                                       | 1 = Secondary specialized school, 2 = Junior college, 3 = Bachelor degree or above |
| Final education                                          | 1 = Secondary specialized school, 2 = Junior college, 3 = Bachelor degree or above |
| Post                                                    | 1 = Nurse practitioner, 2 = Teaching teacher, 3 = Head nurse and above |
| Title                                                   | 1 = Nurse, 2 = Nurse practitioner, 3 = Nurse in charge, 4 = Deputy chief nurse and above |
| Marital status                                          | 1 = Unmarried, 2 = Married, 3 = Divorce or separation |
| Night shifts                                            | 1 = No overtime, 2 = ≤5 hours, 3 = 6–10 hours, 4 ≥ 10 |
| Weekly overtime hours                                   | Continuous variable                             |
| Score of adverse event scale                            | Continuous variable                             |

Table 7: Multiple linear stepwise regression analysis of safety attitudes of operating room nurses (n = 711).

| Independent variable                                      | Partial regression coefficient | Standardization Partial regression coefficient | t    | P     | Partial regression coefficient | 95% CI |
|-----------------------------------------------------------|-------------------------------|-----------------------------------------------|------|-------|-------------------------------|--------|
| (Constant)                                                | 84.346                        | 5.767                                         | 14.625 | <0.001 | 73.023–95.67                 |
| Age group                                                 | 1.253                         | 1.113                                         | 0.07  | 1.126 | 0.261                         | -0.932–3.437 |
| Length of service in the operating room                   | -0.648                        | 1.13                                          | -0.033 | -0.574 | 0.566                         | -2.866–1.57 |
| Mode of employment                                        | -0.632                        | 1.69                                          | -0.019 | -0.374 | 0.708                         | -3.951–2.686 |
| Initial education                                         | 0.159                         | 1.096                                         | 0.005  | 0.145 | 0.885                         | -1.993–2.31 |
| Final education                                           | 0.357                         | 1.078                                         | 0.012  | 0.331 | 0.741                         | -1.76–2.474 |
| Post                                                      | -1.017                        | 1.109                                         | -0.035 | -0.918 | 0.359                         | -3.194–1.159 |
| Title                                                     | -1.292                        | 1.212                                         | -0.065 | -1.066 | 0.287                         | -3.672–1.088 |
| Marital status                                            | -1.595                        | 1.365                                         | -0.053 | -1.169 | 0.243                         | -4.274–1.084 |
| Night shifts                                              | -3.213                        | 1.233                                         | -0.099 | -2.606 | 0.009                         | -5.634–0.792 |
| Weekly overtime hours                                     | 0.431                         | 0.535                                         | 0.028  | 0.805 | 0.421                         | -0.619–1.481 |
| Score of adverse event scale                              | 0.482                         | 0.037                                         | 0.44  | 12.855 | <0.001                        | 0.408–0.556 |
safety of patients with a high acceptance among the medical staff, there is still a gap in the awareness of when to use the checklist, which suggests that medical managers can provide training on adverse event reporting for operating room nurses to improve their awareness [35–37]. In addition, the adverse event reporting rate is closely related to the adverse event reporting process and feedback mechanism [21]. Thus, it is suggested that managers establish a fair, open, communicative, and nonpunitive adverse events reporting culture, optimize the reporting process, and train the nursing staff to master the reporting process so that the personnel are willing to report promptly and accept the errors and problems calmly [38, 39]. Only when the staff exhibits satisfactory cognition and attitudes to the adverse event report can they understand and prevent the errors in nursing work.

5. Conclusion

This paper confirmed that nurses in the operating room of the tertiary class A hospitals in Chengdu, China, had a positive attitude toward safety, but their stress recognition and working conditions needed improvement. Thus, nursing managers should optimize the allocation of nursing human resources in the operating room, strengthen logistics support, and establish a fair and nonpunitive adverse event reporting system to create a safety climate and enhance the nurses’ safety attitudes and beliefs.

This paper only investigated the safety culture of some tertiary hospitals in Western China but not other secondary and community hospitals, which limited the popularization of the study results. Second, the safety attitude of nurses who participated in this study might be influenced by society and institutions, which in turn affects the responses to some questionnaires.

Data Availability

The simulation experiment data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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References

[1] M. Gens-Barberà, C. Rey-Reñones, N. Hernández-Vidal et al., "Effectiveness of new tools to define an up-to-date patient safety risk map: a primary care study protocol," International Journal of Environmental Research and Public Health, vol. 18, no. 16, Article ID 8612, 2021.

[2] J. F. A. Murphy, "World patient safety day," Irish Medical Journal, vol. 112, no. 9, Article ID 997, 2019.

[3] S. Jelacic, A. Bowdle, B. G. Nair et al., "Aviation-style computerized surgical safety checklist displayed on a large screen and operated by the anesthesia provider improves checklist performance," Anesthesia & Analgesia, vol. 130, no. 2, pp. 382–390, 2020.

[4] S. Russ, S. Rout, J. Caris et al., "Measuring variation in use of the multi-surgical safety checklist in the operating room: A multicenter prospective cross-sectional study," Journal of the American College of Surgeons, vol. 220, no. 1, pp. 1–11, 2015.

[5] K. Dinas, E. Vavoulidis, G. C. Pratillas et al., "Gynecology healthcare professionals towards safety procedures in operation rooms aiming to enhanced quality of medical services in greece," International Journal of Health Care Quality Assurance, vol. 32, no. 5, pp. 805–817, 2019.

[6] M. Ock, S. Y. Lim, M.-W. Jo, and S.-I. Lee, "Frequency, expected effects, obstacles, and facilitators of disclosure of patient safety incidents: A systematic review," Journal of Preventive Medicine and Public Health, vol. 50, no. 2, pp. 68–82, 2017.

[7] D. T. Huang, G. Clermont, L. Kong et al., "Intensive care unit safety culture and outcomes: A us multicenter study," International Journal for Quality in Health Care, vol. 22, no. 3, pp. 151–161, 2010.

[8] R. R. Ramos and C. C. Caligidid, "Patient safety culture among nurses at a tertiary government hospital in the philippines," Applied Nursing Research, vol. 44, pp. 67–75, 2018.

[9] M. Murray, D. Sundin, and V. Cope, "New graduate nurses’ understanding and attitudes about patient safety upon transition to practice," Journal of Clinical Nursing, vol. 28, no. 13-14, pp. 2543–2552, 2019.

[10] A. S. Haugen, S. Murugesh, R. Haaverstad, G. E. Eide, and E. Soeteland, "A survey of surgical team members’ perceptions of near misses and attitudes towards time out protocols," BMC Surgery, vol. 13, no. 1, p. 46, 2013.

[11] S. Bahar and E. Önlер, "Turkish surgical nurses’ attitudes related to patient safety: A questionnaire study," Nigerian Journal of Clinical Practice, vol. 23, no. 4, pp. 470–475, 2020.

[12] J.-f. Xie, S.-q. Ding, Z.-q. Zhong et al., "A safety culture training program enhanced the perceptions of patient safety culture of nurse managers," Nurse Education in Practice, vol. 27, pp. 128–133, 2017.

[13] B. Wilson, H. L. Bekker, and F. Fylan, "Reporting of clinical adverse events scale: A measure of doctor and nurse attitudes to adverse event reporting," Quality and Safety in Health Care, vol. 17, no. 5, pp. 364–367, 2008.

[14] S. Rizalar and S. Y. Topcu, "The patient safety culture perception of turkish nurses who work in operating room and intensive care unit," Pakistan journal of medical sciences, vol. 33, no. 2, pp. 374–379, 2017.

[15] M. Armutlu, D. Davis, A. Doucet, A. Down, D. Schierbeck, and P. Stevens, "Patient safety culture bundle for ceos and senior leaders," Healthcare Quarterly (Toronto, Ont.), vol. 22, no. 1, pp. 82–95, 2020.

[16] F. Zhang, L. Tian, X. Shang et al., "Exploring relationships between first-line nurse manager’s safety attitudes and safety factors in henan, china," Journal of Nursing Management, vol. 26, no. 3, pp. 314–320, 2018.

[17] L.-A. Audet, P. Bourgault, and C. M. Rochefort, "Associations between nurse education and experience and the risk of mortality and adverse events in acute care hospitals: A systematic review of observational studies," International Journal of Nursing Studies, vol. 80, pp. 128–146, 2018.
18] A. K. Bhalla, S. Kaul, and V. Kumar, "A longitudinal study of growth in length and weight of punjabi infants in chandigarh, india," Annals of Human Biology, vol. 13, no. 5, pp. 427–431, 1986.

[19] B. Yu, C. F. Wen, H. L. Lo, H. H. Liao, and P. C. Wang, "Improvements in patient safety culture: A national taiwanese survey, 2009-16," International Journal for Quality in Health Care: Journal of the International Society for Quality in Health Care, vol. 32, no. 1, pp. A9–A17, 2020.

[20] M. S. Yoo and K. J. Kim, "Exploring the influence of nurse work environment and patient safety culture on attitudes toward incident reporting," The Journal of Nursing Administration: The Journal of Nursing Administration, vol. 47, no. 9, pp. 434–440, 2017.

[21] G. Yalcin Akgul and N. Aksoy, "The relationship between organizational stress levels and patient safety attitudes in operating room staff," J Perianesth Nurs, vol. 36, no. 5, pp. 499–506, 2021.

[22] American Association of Critical-Care Nurses, “AACN standards for establishing and sustaining healthy work environments: a journey to excellence,” American Journal of Critical Care, vol. 14, no. 3, Article ID 187, 2005.

[23] X. Liu, J. Zheng, K. Liu et al., "Hospital nursing organizational factors, nursing care left undone, and nurse burnout as predictors of patient safety: A structural equation modeling analysis," International Journal of Nursing Studies, vol. 86, pp. 82–89, 2018.

[24] S. Bayramzadeh, A. Joseph, D. San et al., "The impact of operating room layout on circulating nurse’s work patterns and flow disruptions: A behavioral mapping study," HERD: Health Environments Research & Design Journal, vol. 11, no. 3, pp. 124–138, 2018.

[25] I. Peate, "A call to action to improve the visibility of research by nursing, midwifery and care staff," British Journal of Nursing, vol. 27, no. 2, pp. 98–100, 2018.

[26] Y. Kim, H. Y. Kim, and E. Cho, "Association between the bed-to-nurse ratio and 30-day post-discharge mortality in patients undergoing surgery: A cross-sectional analysis using korean administrative data," BMC Nursing, vol. 19, no. 1, p. 17, Article ID 17, 2020.

[27] C. J. van Oostveen, E. Mathijssen, and H. Vermeulen, "Nurse staffing issues are just the tip of the iceberg: A qualitative study about nurses’ perceptions of nurse staffing," International Journal of Nursing Studies, vol. 52, no. 8, pp. 1300–1309, 2015.

[28] E. Ingvarsdottrir and S. Haldorsdottir, "Enhancing patient safety in the operating theatre: From the perspective of experienced operating theatre nurses," Scandinavian Journal of Caring Sciences, vol. 32, no. 2, pp. 951–960, 2018.

[29] L. d. S. Gutierrez, J. L. G. d. Santos, C. C. Peiter, F. H. A. Menegon, L. F. Sebold, and A. L. Erdmann, "Good practices for patient safety in the operating room: nurses’ recommendations," Revista Brasileira de Enfermagem, vol. 71, no. suppl 6, pp. 2775–2782, 2018.

[30] T. C. D’Oliveira and A. Anagnostopoulos, “The association between shift work and affective disorders: A systematic review," Chronobiology International, vol. 38, no. 2, pp. 182–200, 2020.

[31] C. A. M. Roelen, M. F. A. van Hofven, S. Waage et al., "Psychosocial work environment and mental health-related long-term sickness absence among nurses," International Archives of Occupational and Environmental Health, vol. 91, no. 2, pp. 195–203, 2018.

[32] S. H. Weaver, T. G. Lindgren, E. Cadmus, L. Flynn, and C. Thomas-Hawkins, "Report from the night shift: how administrative supervisors achieve nurse and patient safety,” Nursing Administration Quarterly, vol. 41, no. 4, pp. 328–336, 2017 Oct/Dec.

[33] A. J. Hessels, M. Paliwal, S. H. Weaver, D. Siddiqui, and T. A. Wurmsler, "Impact of patient safety culture on missed nursing care and adverse patient events," Journal of Nursing Care Quality, vol. 34, no. 4, pp. 287–294, 2019.

[34] A. Atwal, M. Phillip, and C. Moorley, "Senior nurses’ perceptions of junior nurses’ incident reporting: A qualitative study," Journal of Nursing Management, vol. 28, no. 6, pp. 1215–1222, 2020.

[35] M. Sokhanvar, E. Kakemam, and N. Goodarzi, “Implementation of the surgical safety checklist in hospitals of iran; operating room personnel’s attitude, awareness and acceptance,” International Journal of Health Care Quality Assurance, vol. 31, no. 6, pp. 609–618, 2018.

[36] Y. Feng, F. Li, J. Yan et al., "Pan-cancer analysis and experiments with cell lines reveal that the slightly elevated expression of DLGAP5 is involved in clear cell renal cell carcinoma progression," Life Sciences, vol. 287, Article ID 120056, 2021.

[37] X. Chen, C. Huang, H. Wang et al., “Negative Emotion arousal and altruism promoting of online public stigmatization on COVID-19 pandemic,” Frontiers in Psychology, vol. 12, Article ID 652140, 2021.

[38] S. Gul, S. Ur Rehman, M. Ashiq, and A. Khattak, “Mapping the scientific literature on COVID-19 and mental health,” Psychiatria Danubina, vol. 32, no. 3-4, pp. 463–471, 2020.

[39] A. M. Al-Qahtani, W. T. Elzgar, W. T. Elzgar, and H. A.-F. Ibrahim, "COVID-19 pandemic: Psycho-social consequences during the social distancing period among Najran City population," Psychiatria Danubina, vol. 32, no. 2, pp. 280–286, 2020.