

MINISTRY OF EDUCATION AND TRAINING

MINISTRY OF HEALTH

THAI BINH UNIVERSITY OF MEDICINE AND PHARMACY

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**CURRENT SITUATION AND EFFECTIVENESS OF
SOLUTIONS TO IMPROVE CERTAIN QUALITY
COMPONENTS OF THE HOSPITAL DURING THE COVID-
19 PREVENTION AND CONTROL PHASE AT DIEN BIEN
PROVINCIAL GENERAL HOSPITAL**

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2. **Pham Van Man, Nguyen Quoc Tien, Vu Phong Tuc, Dao Thi Thuy Ngoc, Pham Quang Thang** (2024). Effectiveness of certain intervention solutions to ensure healthcare workers' knowledge on patient safety during the COVID-19 prevention and control phase at Dien Bien Provincial General Hospital in 2021–2022. *Journal of Preventive Medicine*, Volume 34, Issue 6-2024, pp. 79–86.
3. **Pham Van Man, Nguyen Quoc Tien, Vu Phong Tuc** (2024). Enhancing healthcare workers' knowledge of patient safety and infection control through targeted training Dien Bien provincial general hospital, *Journal of Community Medicine*, vol. 65, English version, pp. 243-247.

INTRODUCTION

With the rapid development of science, technology, and information technology, favorable conditions have been created to improve productivity and quality, but it has also brought many challenges to each profession, organization, and locality in quality management. Quality and quality management systems have become important tools to achieve development based on productivity – quality – efficiency.

Healthcare is a sector within the field of social welfare that has implemented various solutions to improve the quality of medical examination and treatment, including reforms in the attitudes and service styles of medical staff aimed at patient satisfaction [1]. Hospital quality management, with the goal of improving the quality of medical services and providing patients with safe and high-quality healthcare, is an urgent task for hospitals. The application of quality management models and the development of quality systems based on ISO 9001 standards with Key Performance Indicators (KPIs), Six Sigma models, etc., are being implemented by several hospitals in Vietnam to improve quality (such as the National Hospital for Tropical Diseases, 108 Military Central Hospital, and the National Institute of Hematology and Blood Transfusion) [2].

In recent years, climate change and disease patterns within populations have undergone significant changes. Non-communicable diseases are on the rise, many infectious diseases have re-emerged, and the emergence and complex developments of the COVID-19 pandemic have directly impacted the healthcare system and all aspects of society. Many weaknesses in the healthcare system, including both treatment and prevention systems, have been exposed, highlighting the growing need to protect the safety of healthcare workers involved in pandemic response and patient care, as well as the need for increasingly high-quality and safe medical services [3], [4]. Therefore, hospitals need to implement improvements to enhance quality, especially in building safe hospitals for COVID-19 prevention and control.

Dien Bien is a mountainous border province located in the northwest of Vietnam, nearly 500 kilometers from the capital, Hanoi. The province shares a national border with China and Laos. Dien Bien Provincial General Hospital is one of four provincial-level hospitals in Dien Bien. In line with the development trends of the national healthcare sector, quality management at Dien Bien Provincial General Hospital is given high importance, identified as a key task and a continuous activity across all departments. The hospital has implemented solutions to improve quality management and pandemic prevention safety, in which patient safety and a patient-centered approach are identified as the "backbone" and "foundation" of all hospital activities.

To evaluate the effectiveness and expand the implementation of solutions and models that ensure patient safety and a patient-centered approach, as well as other elements of the hospital management model during the COVID-19 prevention and control period, we conducted the study titled “*Current situation and effectiveness of solutions to improve certain quality components of the hospital during the COVID-19 prevention and control phase at Dien Bien Provincial General Hospital*” with the following objectives:

1. Describe the current status of hospital quality, patient safety, and patient-centered care during the COVID-19 pandemic prevention and control phase at Dien Bien Provincial General Hospital in 2021.
2. Evaluate the effectiveness of several intervention measures to ensure patient safety and patient-centered care during the COVID-19 pandemic prevention and control phase at Dien Bien Provincial General Hospital from 2021 to 2023.

Layout of the dissertation

The dissertation comprises 135 pages. In addition to the introduction (2 pages), conclusion (2 pages), and recommendations (1 page), it includes four chapters: Chapter 1: Overview (34 pages); Chapter 2: Research Subjects and Methods (26 pages); Chapter 3: Research Results (34 pages); Chapter 4: Discussion (36 pages); The dissertation contains 42 tables, 6 charts, and 142 references (104 in Vietnamese and 38 in English).

CHAPTER 1. LITERATURE REVIEW

1.1. Some related concepts and definitions

- **Patient safety:** Patient safety is understood as ensuring that patients are not harmed further during their treatment in the hospital, or avoiding or minimizing the potential risks and adverse outcomes during their hospitalization, or reducing to the greatest extent possible any unnecessary harm associated with medical care [4], [5], [6].

- **Medical adverse event:** A medical adverse event refers to an unexpected event that occurs with or involves the patient. According to the WHO, an adverse event is harm related to healthcare management (distinct from complications caused by the disease) and includes areas such as diagnosis, treatment, care, and the use of medical equipment to provide healthcare services. Medical adverse events can be preventable or non-preventable [5], [6].

- **Hospital quality** refers to all aspects related to the patient, the patient's family, healthcare providers, and the capacity to perform technical medical procedures; the input factors, operational factors, and outcomes of healthcare services. Some aspects of hospital quality include accessibility to services, patient satisfaction, patient-centered care, and, importantly, ensuring the quality of patient safety, focusing on healthcare providers, professional competence, timeliness, convenience, fairness, and effectiveness [7], [8], [9].

- **Quality of healthcare services:** The quality of healthcare services encompasses two distinct components: **functional quality**, which refers to how the patient receives the service (service accessibility), and **technical quality**, which refers to the quality of the healthcare services provided (competence and treatment outcomes) [10].

1.2. Some models of hospital quality management and patient safety

- Quality management based on standard sets
- ISO quality management (International Organization for Standardization)

- Quality improvement cycle, Total Quality Management (TQM)
- Management by Objectives (MBO)
- Implementation of the 5S tool
- Implementation of medical adverse event reporting systems and effectiveness
- Standard preventive work
- Hospital quality management ensuring patient safety during the complex stages of the COVID-19 pandemic

1.3. Current status of patient safety and patient-centered care in hospital quality management

1.3.1. Current status of patient safety

1.3.1.1. In the World

Globally, numerous studies have evaluated the effectiveness of applying quality management tools aimed at reducing medical adverse events. In the United States, most states passed legislation on medical adverse event reporting in 2003, with amendments made in 2004. Countries such as Australia, Canada, and New Zealand have implemented mandatory medical adverse event reporting systems and voluntary reporting systems in healthcare facilities [5].

1.3.1.2. In Viet Nam

In Vietnam, there have been limited studies on the implementation of quality management ensuring patient safety. Some studies on the knowledge, attitudes, and practices of hospital management staff in Vietnam show that 89.2% of staff have not received training in hospital quality management [35].

1.3.2. Current status of hospital quality management

1.3.2.1. In the World

A study by Assena Stoimenova and colleagues, conducted on 312 hospitals in Bulgaria certified with the ISO 9001 standard, confirmed that the system helped increase operational efficiency, reduce errors, improve patient safety, and establish a preventive approach [53].

1.3.2.2. In Viet Nam

In Vietnam, the Ministry of Health introduced the Hospital Quality Assessment Criteria with 83 indicators to encourage and guide hospitals in implementing activities to improve and enhance hospital quality, ensure patient safety, and staff satisfaction, while being suitable to the country's context [61]. In 2016, the Ministry of Health issued an updated version of the Vietnam Hospital Quality Criteria [2].

1.4. Some solutions to ensure patient safety and patient-centered care in hospital quality management during the COVID-19 pandemic response

- Solutions for patient safety in surgery
- Safety solutions in medication use for patients
- Safety solutions in blood transfusion and intravenous infusion
- Standard precautions
- Comprehensive solutions for hospital quality management, patient safety, and patient-centered care during the COVID-19 pandemic prevention and control phase.

CHAPTER 2:

RESEARCH SUBJECTS AND METHODOLOGY

2.1. Research subject, are and duration

2.1.1. Research subjects

- Healthcare staff at Dien Bien Provincial General Hospital
- Patients seeking inpatient and outpatient care at Dien Bien Provincial General Hospital.

2.1.2. Research area

The study was conducted at Dien Bien Provincial General Hospital, located in Noong Bua Ward, Dien Bien Phu City, Dien Bien Province.

2.1.3. Research duration:

Phase 1: A cross-sectional descriptive study, from June 2020 to June 2021

Phase 2: Development, implementation, and evaluation of the "hospital quality management intervention solution during the COVID-19 pandemic response," from July 2021 to July 2022.

2.2. Research methodology

2.2.1. Research design

The study is designed with two research objectives: a descriptive epidemiological study with a cross-sectional survey for objective 1, and an intervention study with a before-and-after comparison for objective 2.

2.2.2. Sample size and sampling method

2.2.2.1. Sample size

Sample size for healthcare worker survey is calculated using the following formula:

$$n = Z^2_{(1-\alpha/2)} \frac{pq}{e^2} \quad (1)$$

With the selected data, the calculated sample size is 255 healthcare workers. In practice, we surveyed 275 healthcare workers.

Sample size for patient satisfaction survey (inpatients and outpatients): Using the same sample size formula (1), with $p=0.75$, $\alpha=0.05$, and $e=0.05$, the calculated sample size is $n=290$. In practice, we surveyed 334 outpatients and 304 inpatients (initial survey), and for the post-intervention survey, we applied the same formula, surveying 334 outpatients and 304 inpatients.

Sample size for hospital-acquired infection research: The calculated sample size is $n=307$. In practice, we surveyed 325 surgical patient records before the intervention and 325 surgical patient records after the intervention.

2.2.2.2. Sampling technique

- Selecting healthcare workers for the survey: With a total of 486 hospital staff and healthcare workers, we conducted the survey with healthcare workers directly involved in medical examination and treatment. In practice, we surveyed 275 healthcare workers during the first round and 275 healthcare workers in the second round. Therefore, the healthcare workers selected for both rounds were among the 486 healthcare workers of the hospital. We selected all healthcare workers working in professional roles in the hospital departments at the time of the survey, excluding those who met the exclusion criteria.

- Selecting patients for the satisfaction survey:

- + For inpatients: The hospital has a total of 16 inpatient departments, and the sample size is divided according to the proportion of patients in each

department. At each department, during the data collection period, the research team identifies patients who have completed their treatment and are preparing for discharge on the same day. The team contacts and schedules interviews right after the patient completes the discharge procedure and is ready to leave. Patients are selected and interviewed until the required sample size is reached.

- + For outpatients: After the patient collects/purchases medication, the research team contacts and requests an interview. Patients are selected and interviewed until the required sample size is reached.

- Selecting patient records:

- + Medical records of all patients at risk of hospital-acquired infections: Medical records of inpatients who have been treated for 48 hours or more in clinical departments with beds available during the day, as per the Ministry of Health's guidelines on hospital-acquired infections.

- + Documents, management records, technical procedure manuals, and data files on the operations of relevant areas before (from 01/01/2020 to 31/12/2020) and after intervention (from 01/01/2022 to 31/12/2022).

2.2.3. *Variables and indicators in the study*

- * Indicators and variables for Objective 1

- Variables related to general information of healthcare workers: age, gender, years of service, professional qualifications.

- Variables related to healthcare workers' knowledge on patient safety (PS), medical errors (ME), the impact of ME, causes of ME; adverse events in surgery and procedures; ME related to patient management; ME related to medication and equipment; causes of medical errors; general knowledge on patient safety; COVID-19 prevention and safety.

- * Indicators and variables for Objective 2

- Effectiveness of healthcare workers' knowledge about hospital quality and patient safety (PS).

- Effectiveness in reducing the hospital-acquired infection rate.

- Effectiveness in patient satisfaction.

- Effectiveness of healthcare workers' knowledge in COVID-19 prevention and control.

2.2.4. Intervention solutions for hospital quality management and patient safety during the COVID-19 prevention period at Dien Bien Provincial General Hospital

The study applies three main intervention groups as follows:

- **First intervention group:** Strengthening the hospital quality management (HQM) system and patient safety (PS).
- **Second intervention group:** Improving the hospital information system.
- **Third intervention group:** Enhancing hospital quality and COVID-19 prevention based on evidence.

2.2.5. Data processing

- The survey data was processed using Epidata 3.1 software and SPSS 20.0.
- Quantitative results were analyzed according to research objectives, presented in the form of tables with percentages; mean values and standard deviations; charts as required. The Chi-Square test was applied to check the difference between percentages, and the t-test was used to compare two means. A significance level of $p < 0.05$ was considered statistically significant.

- The knowledge questionnaire on patient safety was scored with a total of 79 points. Respondents who scored 55 points or more ($>70\%$ of the total score) were considered to have achieved the required level of knowledge.

- The Effectiveness Indicators (EI) method was used to evaluate the effectiveness of the intervention

2.2.6. Research ethics

The study was approved by the Research Proposal and Ethics Committee of Thai Binh University of Medicine and Pharmacy under Decision 567/QD-YTB dated April 22, 2021. It was also approved by the Department of Health of Dien Bien Province and the Board of Directors, as well as the leadership of the departments of Dien Bien Provincial General Hospital.

The research participants were informed about the purpose of the study before filling out the survey forms.

Patients, their family members, and healthcare workers selected as research subjects have the right to refuse to participate in the study. Participants answering the survey can stop at any time.

CHAPTER 3. RESEARCH RESULTS

3.1. Current situation of hospital quality, patient safety, and COVID-19 prevention and control at Dien Bien Provincial General Hospital

3.1.1. Knowledge of healthcare workers about patient safety at the hospital

Table 3.1. Knowledge of healthcare workers on the correct understanding of patient safety objectives (n=275)

| Information | No | Percentage (%) |
|--|--------------------|----------------|
| Correct patient identification | 200 | 72.7 |
| Ensure safe communication | 126 | 45.8 |
| Ensure safe medication use | 196 | 71.3 |
| Ensure surgical safety | 201 | 73.1 |
| Hospital-acquired infections | 187 | 68.0 |
| Reduce fall risks and consequences | 151 | 54.9 |
| Percentage of correct responses to the 6 items above | 76 | 27.6 |
| Mean \pm Standard Deviation (M \pm SD) | (3,86 \pm 1,9)/6 | |

Table 3.1 shows the healthcare workers' knowledge about the objectives of patient safety, indicating that the highest correct response rate was for ensuring surgical safety (73.1%); correct patient identification was 72.7%; safe medication use was 71.3%, and hospital-acquired infections (HAIs) were 68%; reducing fall risks was 54.9%. The mean \pm standard deviation for this knowledge is (3.86 \pm 1.9)/6.

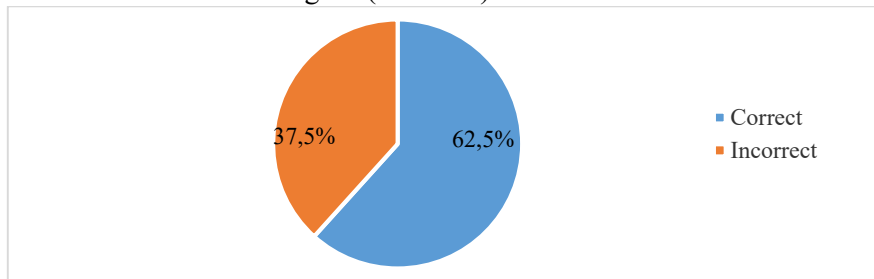


Chart 3.1. Percentage of healthcare workers with correct knowledge about medical errors (n=275)

Chart 3.1 shows that 62.5% of healthcare workers have correct knowledge about medical errors.

Table 3.2. Correct knowledge of healthcare workers about the consequences of medical errors (n=275)

| Information | No | Percentage (%) |
|--|---------------------|----------------|
| New illness or injury | 242 | 88.0 |
| Disability or death | 245 | 89.1 |
| Pain | 168 | 61.1 |
| Percentage of correct answers to the above 3 items | 151 | 54.9 |
| Mean \pm Standard Deviation (M \pm SD) | (2.38 \pm 0.77)/3 | |

The results of Table 3.2 show that 54.9% of healthcare workers have correct and complete knowledge about the consequences of medical errors. The highest response rate is for medical errors leading to disability and death, which accounts for 89.1%. The mean \pm standard deviation for this knowledge is (2.38 \pm 0.77)/3.

Table 3.3. Correct knowledge of healthcare workers about surgical errors and procedures (n=275)

| Information | No | Percentage (%) |
|--|---------------------|----------------|
| Wrong patient or site surgery | 201 | 73.1 |
| Wrong surgical method | 185 | 67.3 |
| Gauze and instruments left in the surgical wound | 192 | 69.8 |
| Immediate or post-surgical death | 192 | 69.8 |
| Percentage of correct answers to the above 4 items | 117 | 42.5 |
| Mean \pm Standard Deviation (M \pm SD) | (2.80 \pm 1.26)/4 | |

Table 3.3 shows that 42.5% of healthcare workers have correct and complete knowledge about surgical errors. The highest percentage is for the item on "wrong patient or site surgery," which accounts for 73.1%. The mean \pm standard deviation for this knowledge is (2.80 \pm 1.26)/4.

Table 3.4. Correct knowledge of healthcare workers about medical errors related to patient management (n=275)

| Information | No | Percentage (%) |
|--|---------------------|-----------------------|
| Wrongly handing over newborns at discharge | 239 | 86.9 |
| Errors occurring with patients outside the healthcare facility | 97 | 35.3 |
| Patient death due to suicide within the hospital | 217 | 78.9 |
| Percentage of correct answers to the above 3 items | 83 | 30.2 |
| Mean \pm Standard Deviation (M \pm SD) | (2.01 \pm 0.83)/3 | |

Table 3.4 shows that healthcare workers have varying levels of knowledge about medical errors related to patient management, with the mean \pm standard deviation for this knowledge of (2.01 \pm 0.83)/3. The highest percentage of correct answers was for the item "wrongly handing over newborns at discharge" (86.9%).

Table 3.5. Knowledge of healthcare workers on medical adverse events related to drugs and equipment (n=275)

| Information | No | Percentage (%) |
|---|---------------------|-----------------------|
| Use of contaminated drugs, equipment, and biological substances | 192 | 69.8 |
| Use of faulty equipment | 201 | 73.1 |
| Placement of air embolism-causing devices | 193 | 70.2 |
| Correct answers to the three items above | 132 | 48.0 |
| Mean \pm Standard Deviation (M \pm SD) | (2.13 \pm 1.01)/3 | |

The results in Table 3.5 show that healthcare workers have knowledge about medical adverse events related to drugs and medical equipment, with 48% answering correctly on the three items. The mean \pm standard deviation for this knowledge is (2.13 \pm 1.01)/3.

Table 3.6. Knowledge of healthcare workers on the causes of medical adverse events (n=275)

| Information | No | Percentage (%) |
|--|---------------------|----------------|
| System errors | 198 | 72,0 |
| Work environment | 176 | 64,0 |
| Medical expertise | 195 | 70,9 |
| Individual errors | 210 | 76,4 |
| Correct answers to the four items above | 112 | 40,7 |
| Mean \pm Standard Deviation (M \pm SD) | (2.83 \pm 1.20)/4 | |

Table 3.6 shows that when asked about the causes of medical adverse events, 76.4% of healthcare workers attributed them to individual errors; 70.9% to medical expertise; 72.0% to system errors, and 76.4% to individual errors. However, the percentage of those who answered all four items correctly was 40.7%. The mean \pm standard deviation for this knowledge is (2.83 \pm 1.20)/4.

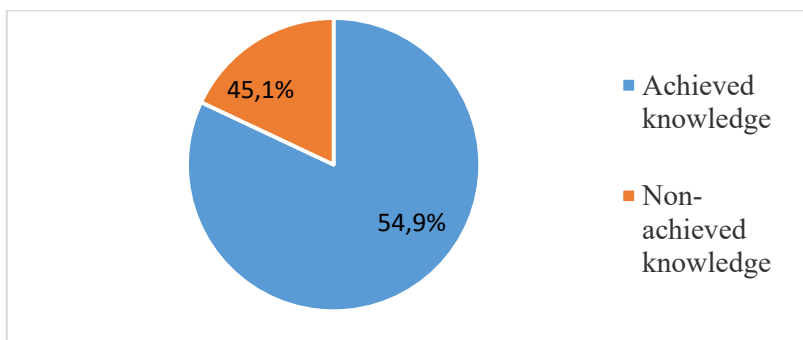


Chart 3.2. Overall knowledge of healthcare workers on patient safety (n=275)

Chart 3.2 shows that, considering all aspects of patient safety, the percentage of healthcare workers with adequate knowledge of patient safety is 54.9%.

3.1.2. Patient safety and patient-centered care in the context of COVID-19 prevention

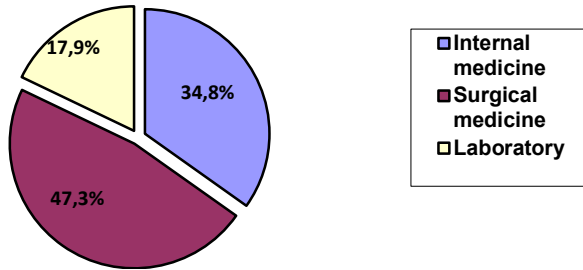


Chart 3.3. Distribution of medical adverse events by department in 2021 (n=307)

Chart 3.3 shows that in 2021, there were 307 medical adverse events across the hospital. Of these, 47.3% occurred in the surgical department, 34.8% in the internal medicine department, and 17.9% in the laboratory departments

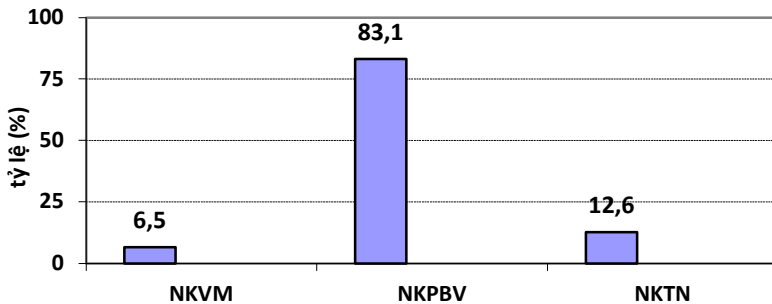


Chart 3.4. Hospital-acquired pneumonia, surgical site infections, and urinary tract infections rates in 2021 (n=325)

The results from Chart 3.4 indicate that in 2021, the rate of hospital-acquired pneumonia was 83.1%, followed by urinary tract infections at 12.6%, and surgical site infections at 6.5%.

Table 3.7. Survey results on correct hand hygiene practices during injections/infusions (n=230)

| Information | No | Percentage (%) |
|---|-----|----------------|
| Before preparing for injection/infusion | 182 | 79,1 |
| Before preparing medication | 163 | 70,9 |
| Before disinfecting the injection site/needle insertion | 222 | 96,5 |
| After injection | 206 | 89,6 |

The results in Table 3.7 show that among 230 healthcare workers surveyed on injection safety, 79.1% correctly practiced hand hygiene before preparing the injection, 70.9% practiced correct hand hygiene before preparing the medication, and 89.6% followed proper hand hygiene after the injection.

Table 3.8. Survey results on the "Five rights" practice in injections/infusions (n=230)

| Information | No | Percentage (%) |
|------------------|-----|----------------|
| Right patient | 230 | 100 |
| Right medication | 230 | 100 |
| Right dose | 230 | 100 |
| Right route | 228 | 99.1 |
| Right time | 176 | 76.5 |

Table 3.8 indicates that 100% of the surveyed healthcare workers followed correct practices regarding the right patient, right medication, and right dose in injection/infusion procedures. The proportion adhering to the correct timing was 76.5%.

Table 3.9. Patient satisfaction with accessibility

| Information | Mean Satisfaction Score (Mean \pm SD) | p |
|---------------------|---|-------|
| Inpatients (n=304) | 3.59 \pm 0.33 | >0.05 |
| Outpatients (n=334) | 3.53 \pm 0.27 | |

The results in Table 3.9 show that the mean satisfaction score for inpatients was 3.59 ± 0.33 , while for outpatients it was 3.53 ± 0.27 . The difference was not statistically significant ($p > 0.05$).

Table 3.10. Inpatient satisfaction with transparency of information and medical examination and treatment procedures

| Information | Mean Satisfaction Score (Mean \pm SD) | p |
|---------------------|---|----------|
| Inpatients (n=304) | 3.58 \pm 0.31 | >0.05 |
| Outpatients (n=334) | 3.62 \pm 0.23 | |

Patient satisfaction with the transparency of information and medical examination and treatment procedures is presented in Table 3.10. The results indicate that satisfaction levels were comparable between the two groups, with no statistically significant difference ($p > 0.05$).

Table 3.11. Patient satisfaction with facilities and equipment for medical examination and treatment

| Information | Mean Satisfaction Score (Mean \pm SD) | p |
|---------------------|---|----------|
| Inpatients (n=304) | 3.77 \pm 0.29 | >0.05 |
| Outpatients (n=334) | 3.67 \pm 0.28 | |

The results presented in Table 3.11 show that the mean satisfaction score of inpatients regarding facilities and equipment for medical examination and treatment was 3.77 ± 0.29 , while for outpatients it was 3.67 ± 0.28 . The difference was not statistically significant ($p > 0.05$).

Table 3.12. Patient satisfaction with the attitudes and professional competence of healthcare workers

| Information | Mean Satisfaction Score (Mean \pm SD) | p |
|---------------------|---|-------|
| Inpatients (n=304) | 3.43 \pm 0.29 | >0.05 |
| Outpatients (n=334) | 3.49 \pm 0.32 | |

As shown in Table 3.12, the mean satisfaction score of inpatients regarding the attitudes and professional competence of healthcare workers was 3.43 ± 0.29 , while for outpatients it was 3.49 ± 0.32 . The difference between the two groups was not statistically significant ($p > 0.05$).

Table 3.13. Patient satisfaction with service delivery outcomes

| Information | Mean Satisfaction Score (Mean \pm SD) | p |
|---------------------|---|-------|
| Inpatients (n=304) | 3.42 \pm 0.35 | >0.05 |
| Outpatients (n=334) | 3.47 \pm 0.32 | |

Table 3.13 indicates that the mean satisfaction score for service delivery outcomes was 3.42 ± 0.35 among inpatients and 3.47 ± 0.32 among outpatients. The difference between the two groups was not statistically significant ($p > 0.05$).

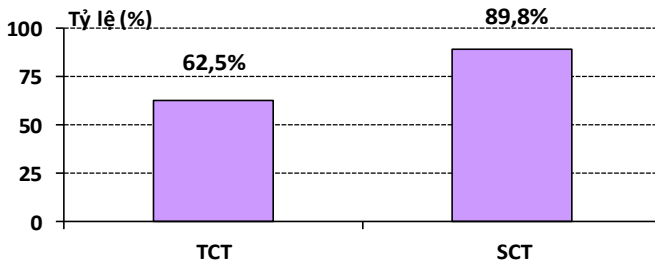


Chart 3.5. Proportion of healthcare workers with accurate knowledge of adverse events before and after intervention (n=275)

Chart 3.5 illustrates that the proportion of healthcare workers with accurate knowledge of adverse events increased from 62.5% before the intervention to 89.8% after the intervention. This difference was statistically significant ($p < 0.05$), with an intervention effectiveness rate of 43.7%.

Table 3.14. Assessment results of healthcare workers' accurate knowledge on selected patient safety topics before and after intervention

| Survey content | Before intervention (n=275) | After intervention (n=275) | p |
|---|-----------------------------------|----------------------------------|--------|
| | (Mean \pm SD) | (Mean \pm SD) | |
| Patient safety goals | 3.86 \pm 1.93 | 5.04 \pm 1.15 | < 0.05 |
| Harm caused by medical adverse events | 2.38 \pm 0.77 | 2.90 \pm 0.42 | < 0.05 |
| Adverse events in surgery/procedures | 2.80 \pm 1.26 | 3.80 \pm 0.49 | < 0.05 |
| Adverse events related to patient management | 2.01 \pm 0.83 | 2.80 \pm 0.55 | < 0.05 |
| Adverse events related to medication and medical devices | 2.13 \pm 1.01 | 2.90 \pm 0.39 | < 0.05 |
| Causes of medical adverse events | 2.83 \pm 1.20 | 3.69 \pm 0.63 | < 0.05 |
| Requirements for accurate surgical procedures | 2.14 \pm 0.94 | 2.80 \pm 0.43 | < 0.05 |
| Common hospital-acquired infections and associated risk factors | 4.84 \pm 1.58 | 5.70 \pm 0.70 | < 0.05 |
| Safe use of infusion pumps for patients | 1.87 \pm 0.95 | 2.80 \pm 0.43 | < 0.05 |

The results presented in Table 3.14 demonstrate that healthcare workers' knowledge regarding various aspects of patient safety significantly improved after the intervention, with statistically significant differences observed across all areas ($p < 0.05$). Specifically, the mean knowledge score for patient safety goals increased from 3.86 ± 1.93 to 5.04 ± 1.15 ; for the harm caused by adverse events, the score rose from 2.38 ± 0.77 to 2.90 ± 0.42 ; and for common hospital-acquired infections and associated risk factors, the score improved from 4.84 ± 1.58 to 5.70 ± 0.70 .

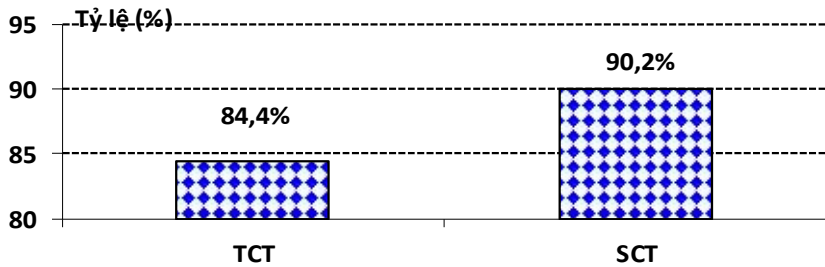


Chart 3.6. Percentage of healthcare workers with correct knowledge about the harm caused by medical errors before and after the intervention (n=275)

The results presented in Chart 3.6 indicate that the percentage of healthcare workers who correctly identified and could fully describe the harm caused by medical errors increased from 84.4% before the intervention to 90.2% after the intervention. This difference was statistically significant with $p < 0.05$. The change in the rate of correct responses was 6.9%.

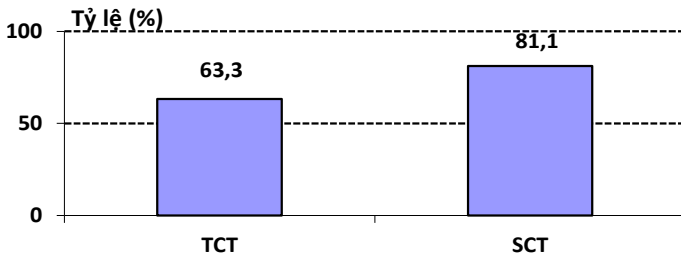


Chart 3.2. Percentage of healthcare workers with correct knowledge of WHO-recommended solutions for patient safety before and after the intervention (n=275)

The results in Chart 3.7 show that the percentage of healthcare workers with correct knowledge about WHO-recommended solutions for patient safety was higher after the intervention than before, with $p < 0.05$. The change in the rate of correct responses (CSHQ) was 28.1%.

Table 3.15. Percentage of healthcare workers achieving correct knowledge about patient safety before and after the intervention

| <div>Group</div> <div>Knowledge</div> | Before intervention (n=275) | | After intervention (n=275) | | P |
|---------------------------------------|--------------------------------|------|-------------------------------|------|-------|
| | No | % | No | % | |
| Not achieved | 124 | 45.1 | 27 | 9.8 | <0.05 |
| Achieved | 151 | 54.9 | 248 | 90.2 | |
| Efficiency index (%) | 64.2 | | | | |

The results of Table 3.16 show that the percentage of healthcare workers with achieved knowledge about patient safety before the intervention was 54.9%, which significantly increased to 90.2% after the intervention. This difference is statistically significant, and the effectiveness index is 64.2%.

CHAPTER 4. DISCUSSIONS

4.1. Current situation of hospital quality, patient safety, and COVID-19 prevention safety at Dien Bien Provincial General Hospital

Patient safety (PS) is a concern for every country, healthcare facility, citizen, and society. In Vietnam, the Ministry of Health has paid close attention and provided strong leadership in ensuring patient safety. The Ministry has also advised the National Assembly on the promulgation of the 2023 Law on Examination and Treatment. In this study, we conducted a survey of 275 healthcare workers (HCWs) working at the hospital, of whom 70.9% were female, and the most common age group was 30-39 years, accounting for 53.1%. The study assessed the knowledge and practices of HCWs regarding the objectives of patient safety, which include ensuring the following six criteria: identifying patients, ensuring safe communication with patients, ensuring safe use of medications, surgical safety, infection control, and

reducing the risk and consequences of falls. The results indicate that HCWs do not have full knowledge of the content of patient safety objectives. The highest percentage of correct answers was related to ensuring surgical safety (73.1%) and accurately identifying patients (72.7%). The average knowledge score was only 3.86 ± 1.9 out of 6. The percentage of HCWs who correctly and fully answered all patient safety objectives was only 27.6%.

Adverse Event (AE) refers to undesirable situations that occur during the diagnosis, care, and treatment processes due to both objective and subjective factors, not caused by the disease progression or the patient's condition, which impact the patient's health and life. When asked about this content, only 62.5% of healthcare workers (HCWs) answered correctly. Between 61.1% and 89.1% of HCWs could identify the harm caused by Adverse Events (AEs). The average knowledge score/maximum knowledge score achieved was only $2.38 \pm 0.77/3$. Specific knowledge about AEs in hospitals, such as AEs during surgery and procedures, achieved an average knowledge score of $2.8 \pm 1.26/4$; the highest correct answer rate was for AEs that could occur, such as wrong-site surgery or wrong patient identification, at 73.1%.

Knowledge of AEs related to patient management is also a crucial aspect of patient safety that HCWs must fully understand in order to prevent them. Our results show that 86.9% of HCWs were aware of the AE related to misidentification of newborns, and 78.9% knew about AEs like patient suicide or self-harm in the hospital. However, the knowledge score for this content was only $2.01 \pm 0.83/3$. Similarly, HCWs' knowledge about AEs related to medications, equipment, and causes of AEs also scored only $2.13 \pm 1.01/3$. Other aspects of patient safety, such as the requirements for accurate surgery, medication errors in dispensing and use, and the stages of safety checks in surgery, were not well answered by HCWs.

Regarding the general knowledge of healthcare workers about patient safety, the research team calculated the total score for the questions regarding healthcare workers' knowledge in various areas of patient safety. Each correct answer was awarded 1 point, with the maximum score a healthcare worker could achieve being 79 points. A healthcare worker was considered to have adequate knowledge if they scored 55 points or higher (70% of the total possible points). Analysis of the results showed that the percentage of

healthcare workers in our study with adequate general knowledge about patient safety was 54.9%. This result is lower than the study conducted by Nguyen Thi Hai Ha and colleagues at Moc Chau General Hospital, which reported that 60.6% of healthcare workers had correct knowledge about patient safety. Our study's results also align with findings from Lu Thuy Hue and colleagues at Tu Du Hospital, which showed that 60.18% of healthcare workers had good knowledge about reporting medical errors. Furthermore, the study conducted by Pham Quyet Thang and colleagues at Gia Lai Provincial General Hospital in 2021 also found that 68.67% of healthcare workers had adequate knowledge about medical errors.

4.2. Effectiveness of some intervention measures to improve hospital quality, ensure patient safety, and make patients the center of care during the COVID-19 prevention phase

The research results show that the percentage of healthcare workers with correct knowledge about medical incidents before the intervention was 62.5%, and after the intervention, it increased to 89.8%. The difference is statistically significant with $p < 0.05$, and the effectiveness index reached 43.7%. Our findings are lower compared to a study by Le Thu Hoa and colleagues at Hanoi Medical University Hospital, which reported that healthcare workers who were trained on medical incidents had a correct response rate of 67.5%, which is twice as high as that of the untrained group (32.5%). This difference, in our opinion, could be attributed to the time and location of the study. To ensure patient safety, healthcare workers must have correct knowledge about medical incidents, which will help them proactively identify and apply preventive measures. The positive results of this research indicate that after the intervention, healthcare workers' knowledge of medical incidents has improved, which will contribute to preventing medical incidents and significantly enhance patient safety.

When studying the correct knowledge of healthcare workers (HCWs) regarding certain aspects of patient safety (PS) before and after the intervention, the results showed significant improvements across several areas. These areas included PS objectives, the harms of medical adverse events (AEs), incidents during surgery and procedures, incidents in patient

management, errors related to medication and equipment, causes of AEs, requirements for accurate patient surgery, common hospital-acquired infections, and the use of infusion pumps for patients. All of these areas showed statistically significant increases post-intervention ($p<0.05$). Specifically, the average knowledge scores for the following areas improved significantly: PS objectives, with the score increasing from 3.86 ± 1.93 to 5.04 ± 1.15 ; the harms of AEs, with the score increasing from 2.38 ± 0.77 to 2.90 ± 0.42 ; and common hospital-acquired infections and their risk factors, with the score increasing from 4.84 ± 1.58 to 5.70 ± 0.70 . Additionally, the percentage of HCWs who correctly understood the harms of AEs rose to 90.2% after the intervention, with an effectiveness index of 6.9%. Our results are consistent with the study conducted by Lai Duc Tri at Thai Binh General Hospital, which found that after the intervention, HCWs' knowledge about AEs significantly improved compared to before the intervention.

The study investigated the percentage of HCWs with correct knowledge regarding the WHO-recommended solutions for patient safety (PS). Our results show a significant improvement in HCWs' knowledge on this topic post-intervention, with a statistically significant difference ($p<0.05$) and an effectiveness index of 28.1%. Our findings indicate that HCWs' knowledge of surgical safety before the intervention was 84.7%, and after the intervention, the percentage increased to 95.3%, with a statistically significant difference ($p<0.05$) and an effectiveness index of 12.5%. These results are consistent with the study by Lai Duc Tri, which reported 86% before the intervention and 98% after.

Surgical procedures are a common area where errors and incidents occur. If these errors happen, they can lead to severe consequences affecting patients' health and life. Therefore, the improvement in HCWs' knowledge of surgical safety post-intervention is a positive factor in ensuring patient safety.

Our research findings indicate a significant improvement in healthcare workers' knowledge of patient safety following the intervention, with the percentage increasing from 73.1% to 85.5%, and an effectiveness index of 17%. When evaluating the overall content and scoring knowledge, the results show that the percentage of HCWs with correct general knowledge about patient safety post-intervention increased significantly to 90.2%, compared

to 54.9% before the intervention. The effectiveness index reached 64.2%. Thus, through the implementation of the intervention measures, the first positive outcome we observed was a substantial improvement in the general knowledge of healthcare workers regarding patient safety, with a high effectiveness.

Limitations of the Study: Since patient safety (PS) is a broad concept with multiple influencing factors, and because each researcher investigates different aspects, the similarities between studies are limited, and the comparison of results across studies is relative. The study conducted was a community-based intervention, but it lacked a control group. The absence of a control group may reduce the reliability of the results, as it is not possible to exclude the influence of other confounding factors apart from the intervention. The study also did not address factors that could influence the effectiveness of the intervention, such as differences in the work environment, the educational level of healthcare workers, or prior training programs that healthcare workers had participated in, which could impact their knowledge in this field.

CONCLUSIONS

1. Current status of hospital quality, patient safety, and covid-19 prevention safety at Dien Bien Provincial General Hospital

The rate of healthcare workers with general knowledge about patient safety (PS) is 54.9%, with 59.6% of healthcare workers indicating that implementing patient safety practices still faces many difficulties.

The assurance of patient safety has many limitations, with the hospital infection rate being concerning. The rate of hospital-acquired pneumonia is 83.1%, surgical wound infections account for 6.5%, and urinary tract infections make up 12.6%.

Patient satisfaction regarding accessibility to services, transparency of information, healthcare workers' attitudes and professional competence, as well as service quality, is relatively good. No significant differences were found between inpatient and outpatient satisfaction levels with a p-value of <0.05 .

Regarding COVID-19 prevention efforts, 92.7% of healthcare workers consider COVID-19 safety essential, while the rate of healthcare workers with knowledge about COVID-19 prevention safety is 70.2%.

2. Effectiveness of some interventions to ensure patient safety, with a patient-centered approach, during the COVID-19 Prevention Phase

The rate of hospital-acquired infections and medical errors has decreased. The rate of hospital-acquired pneumonia decreased from 83.1% to 71.4%, surgical site infections decreased from 6.5% to 3.7%, and urinary tract infections decreased from 12.6% to 6.2%, with statistically significant differences ($p<0.05$).

Patient satisfaction has significantly improved, with the average score after the intervention consistently above 4/5 on a 5-point Likert scale.

The awareness of healthcare workers about COVID-19 safety measures has been enhanced, with the average score for general preventive measures reaching 1.81 ± 0.54 ; for infection control measures, it reached 3.9 ± 1.45 ; and for knowledge of personal protective equipment usage, it reached 6.46 ± 2.12 . The differences are statistically significant with $p<0.05$, demonstrating the effectiveness of the intervention measures.

RECOMMENDATIONS

Enhancing clinical procedures and strengthening hospital infection control, with particular emphasis on hospital-acquired pneumonia, are essential measures to minimize nosocomial transmission and limit the spread of infectious diseases within healthcare settings. Special attention should be given to safeguarding high-risk patient groups. The implementation of a patient-centered hospital model, focusing on improving quality of care and fostering more professional attitudes among healthcare personnel, is crucial to increasing patient satisfaction.

It is imperative to reinforce both initial and continuous training for healthcare workers on fundamental principles of patient safety and infection prevention. Such training enables medical staff to acquire knowledge, translate it into practice, and gradually establish a culture of patient safety and infection control. Encouraging the reporting of medical incidents is vital to ensure timely corrective actions, thereby reducing risks to patients.

Proactive preparedness for epidemic prevention, including specific strategies for COVID-19, should be prioritized to ensure timely responses to emerging situations. Continuous training and professional development must be strengthened to consolidate comprehensive treatment capacities. Simultaneously, sustained efforts should be devoted to improving surveillance systems and reinforcing infection prevention and control measures against COVID-19.