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Incident Reporting Culture in the Critical Care Units: Barriers, and Suggestions for Improvement from Nurses' Perspectives

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Abstract
Background: Critically ill patients are highly susceptible to unintended harm and benefit from incident reporting as an important first step in improving patient safety. Nurses are responsible for maintaining the safety culture, however, several barriers hinder their ability to ensure that patients remain safe. One of these barriers is underreporting or failure to report the incidents or the adverse effects. **Aim:** Determine the barriers that hinder incident reporting and strategies to improve these barriers as the critical care nurses perceive them. **Design:** A mixed study design was used to conduct the study**. Sample:** data were collected from all nurses (251) who worked in the main university hospital. **Tool:** An incident reporting survey was developed by the researcher to collect the required data and it comprises of four sections; sections 1, 2, and 3 were used to collect the quantitative data, and section 4 was used to collect the qualitative data. **Results:** The most significant barriers perceived by the nurses as barriers that hindered the reporting of the incidents were categorized into lack of awareness, fear, and worries about disciplinary action, litigation, being tracked down, blaming, and losing support from their colleagues, heavy workload, and other organizational or system-related barriers. **Conclusion:** Based on the results of the current study, can be concluded that the most significant barriers were lack of awareness (incident reporting-related knowledge), fear and worries, workload, limited time, and other organizational or system barriers. Additionally, the nurses' suggestions to those barriers were reporting anonymously, providing feedback, creating an incident reporting culture, making the procedure more simple, promoting a blame-free environment orienting the nurses regarding what and how to report, increasing the nurses' salaries, and hiring new nurses to overcome the heavy workload. **Recommendation:** Consider all the barriers mentioned by the nurses to incident reporting in the workplace and the suggested strategies to overcome or solve these barriers a priority of the managers and policymakers of the critical care units to maintain the quality of care and patient safety.

Keywords: Critical Care Units, Barriers, Incident Reporting & Nurses' Perspectives

Introduction
Within hospitals, Critical Care Units are particularly vulnerable to medical errors and adverse effects due to the complexity of patient care and the fragile medical conditions of the patients. The occurrence of medical errors in critical care units is inevitable, multidimensional, and constantly threatening to the safety of patients. Medical errors are caused by a variety of interactions involving human behavior, the complexity of patients' conditions, sociocultural factors, and system aspects **(Higgins & Herpy, 2021).**

A participatory and systematic approach to accident reporting could help learn from mistakes and accidents in the same context. In addition, the case report can be a source of information for other patients worldwide. Various types of errors can be identified and discussed between healthcare professionals, as well as prevention mechanisms could be put in place by accident reporting **(Higgins & Herpy, 2021; Kathure, 2018; Ramírez et al., 2018).**

An incident reporting mechanism allows healthcare professionals in critical care units to report undetected injuries and near misses that may result from a medical system or health professional's actions. The number of underreported incidents remains high in various countries worldwide, despite an important contribution to patient safety made by incident reporting. In the United States, for instance, it occurs at a rate between 50% and 96%. Studies in the UK have shown that 25% of healthcare professionals do not know how to use incident reporting. Even though nurses were aware of the incidents, 40% of them did not complete the report. **(Campbell, 2021; Chiang et al., 2021; Kruk et al., 2018; Vincent et al., 2017).**

The non-reporting or underreporting of incidents was linked to several factors. According to a qualitative study conducted in Korea, there were ninety-six obstacles to incident reporting in their hospitals. Individual and organizational obstacles have been highlighted. Low reporting rates, poor design of incident reporting systems, insufficient leadership support, and a culture that does not support the patient's safety culture are some of the most frequent barriers reported by the study. A year earlier, a similar study of Iranian nurses highlighted the following barriers to their perceptions: fear of legal action, threats to employment and economic losses as well as concern for honor and dignity. **(Chiang et al.,**

2021; Engeda, 2016; Farokhzadian et al., 2018; Hamed & Konstantinidis, 2022; Joanna et al., 2018).

Some measures have been put in place to improve incident reporting, such as training on event reporting, and reducing the fear and burden of reports with an improved feedback system. It has been suggested that the local incident reporting process motivates health professionals to report, according to a study carried out in the Netherlands evaluating national and central incident reporting systems. To address the general and recurrent safety concerns of patients, it has been found that a centralized incident reporting system can be helpful in comparison with the local notification systems described in this study **(Farokhzadian et al., 2018; Hamed & Konstantinidis, 2022; Jha et al., 2013; Joanna et al., 2018; Woo & Avery, 2021).**

To determine the weaknesses, errors, and barriers, healthcare institutions need to report patient incidents for patients' safety. There have been several studies about patient safety culture and attitudes of healthcare professionals in other countries, but little is known about the contributing factors to patient safety incidents reporting in Egypt. As far as we know, this study is the first to examine the views of nurses on the working environment as a contributing factor and barrier to patient safety incidents in the critical care unit. To help the hospital develop an appropriate mechanism for notifying incidents **(Engeda, 2016; Farokhzadian et al., 2018; Hamed & Konstantinidis, 2022; Jha et al., 2013; Joanna et al., 2018)**.

Significance of the Study

Incident management, including reporting, plays a vital role in maintaining patient safety, quality of care, and professional responsibility within the critical care unit. The Critical Came Unit authorities can identify patterns or trends in patient safety concerns by reporting incidents. In addition, the analysis of incident reports allows for corrective action to be taken, quality improvements, and training initiatives to prevent similar incidents from happening again. In addition, incident reports provide a formal record of any incident, error, or near miss that occurs in the course of patient care, which is essential for legal purposes, risk management, and compliance with regulatory requirements. Incident reports provide a clear indication of an incident, the steps taken to deal with it, and any subsequent action that can help protect healthcare providers as well as organizations legally. The reporting of incidents contributes to a culture of learning and continuous improvement within the critical care units. By encouraging staff to report incidents without fear of blame or retribution, organizations can foster an environment where lessons are learned from mistakes and shared across the team.

Aim of the Study

Determine the barriers that hinder incident reporting and strategies to improve these barriers as the critical care nurses perceive them.

Research Questions

1) What are the barriers altering incident reporting in the critical care unit from the nurses' perspectives?
2) What are the suggested strategies to improve patient safety culture from the nurses' perspectives?

Subjects and Method

Design: A mixed study design was used to collect the data for the current study. for quantitative data, a descriptive cross-sectional survey was used to collect the data. Interviews with the nurses have been used to gather qualitative data.

Settings: The study was conducted in eight Critical Care Units at Mian University Hospital. These units are dedicated to providing care for adult critically ill patients who suffer from multiple critical conditions and require intensive continuous care.

Sample: All the available **(**a nonprobability useful sample of 251) nurses working in the selected settings were recruited. The sample size was estimated using an electronic sample size calculator at a confidence level of 95%, and a margin of error of 5%. The required sample size was 234 nurses by this formula. The sample size was increased to 251 given the possible number of nurses leaving.

Inclusion criteria: Nurses who provided direct patient care, accepted to participate in the study, and have at least 6 months of experience.

Tool: Incident Reporting Survey

This survey was developed by the researchers after reviewing the relevant literature. **(Abualrub et al., 2022; Evans et al., 2006; Naome et al., 2020; Oweidat et al., 2023)** to identify the barriers that hindered incident reporting and to explore the nurses' suggestions to improve the incident reporting culture. The tool comprised four sections.

Section one was developed to collect the personal and clinical data of the nurses: age, sex, education, experience in nursing, working hours per week, nurse: patient ratio, attendance of any incidence reporting educational activities, and if the nurses were working in private places (healthcare or non-healthcare sectors).

Section two assesses the nurse's awareness of the incident reporting system. This part consists of a dichotomous scale of five yes or no questions and was scored as the following: (yes = 2), (no = 1), with a total score of 10. Where the higher score indicates a greater awareness.

Section three aims to address the barriers to reporting incidents as perceived by the nurses who participated in the study and it consists of 19 barriers. Nurses' level of agreement was reflected on a 5-point Likert

scale where 5 = strongly agree, and 1 = strongly disagree.

Section fourth consists of two open-ended questions. The nurses were asked to answer the pre-structured questions "What are barriers not captured in the Incidents Report (IR) questionnaire?" and "What are your suggestions to solve these barriers to improve the incident reporting culture?

Validity of the tool

The content validity of the tool was assessed by a panel of experts in the field of critical care nursing and medicine. All proposed changes have been made, such as a translation of the survey into Arabic for nurses to suit their mother language.

Reliability of the tool

The reliability of the tool was tested by Cronbach's Alpha, and it came out as =0.86 which means that the tool had been reliable.

Pilot Study

To assess the clarity of the survey, as well as any issues encountered by nurses in completing it, a pilot study was carried out on 25 nurses who had the inclusion criteria. The pilot study results indicated that the survey was clear and understandable. Because the nurses experienced no problems and no suggestions for changes were reported, so that, the nurses included in the pilot study were not excluded from the study.

Ethical Considerations

The approvals of the Institutional Review Board at the affiliated university (IRB 13620) and the Ethics of Human Research Committee of the targeted hospital were granted. Other approvals were obtained from the hospital's and selected units' directors. Written consent from the nurses was obtained, after explaining the aims of the study, anonymity, confidentiality principles, and the voluntary nature of their participation.

Data collection

Before data collection, the tool was translated into Arabic to suit the nurses' mother tongue. Two bilingual experts in English and their mother tongue Arabic translated the English version into Arabic. The two versions were submitted to the third bilingual expert to compare them for concept similarity and equivalence **(Khalaila, 2013)**. Data were collected between August to September 2023 through a self-administered survey and face-to-face interviews with the nurses. The researchers obtained a list of nurses' names and working schedules to collect data so that they could attend the meeting at their convenience. Arrangements for the meetings with the nurses including the venue of meetings, time of meetings, and catering services were done by the researchers with the help of the head nurse and office boy. A conference room close to the selected units was booked for meetings. Three different times were determined for meetings; before the shift, after the shift, or the off-duty day. Nurses were asked to choose one of these schedules. A quantitative questionnaire was handed in by the researchers and nurses completed them while the researchers attended to explain and answer any nurses' questions. After completion of the questionnaire, the researchers invited the nurses to a coffee break. They were then invited for face-to-face interviews using a semi-structured questionnaire. The interviews were conducted by two researchers. All interviews were initiated by asking the nurses to answer two open-ended questions. The two researchers observed and took notes. The written nurses' answers were read to the nurses to confirm and comment upon. By the end of the meeting, the researchers thanked the nurses. Afterward, each nurse received a bag of gifts including a pen, ID of the nurse's name, and incident reporting system culture and brochure about the incidents reporting system. All data were numerically coded and submitted to the biostatistician expert in qualitative data analysis. The interviews lasted for 90–120 min.

Statistical Analysis

The quantitative data was analyzed by the Statistical Package for Social Science (SPSS). Descriptive statistics (frequency, and percentages) were calculated for the demographics, awareness, and barriers to the incident report culture. Qualitative content analysis based on the following steps has been used to analyze nurses' responses to identify key themes related to barriers and suggestions for improvement of incident reporting: preparation of data, transcribing interviews, and extraction of responses from open-ended questions, defining the unit of analysis, to represent one or more themes or issues that are important for the study questions, and coding the text by Microsoft Excel. The trustworthiness of the data collected by open-ended questions such as credibility, transferability, dependability, and confirmability were followed, for example, the nurses were given the chance to correct the researcher's summaries, and they were allowed to add further information. In so doing, the credibility of the data was established. And using coded data to conclude.

Results

Table (1): Distribution of the personal and clinical characteristics of nurses (n = 251)

Characteristics of Nurses	Number	Percent (%)
Age		
20 -25	130	51.8
26 – 30	63	25.1
31 – 35	28	11.2
36 - 40	18	7.1
> 40	12	4.8
Gender		
Male	79	31.5
Female	172	68.5
Level of nursing education		
Diploma	165	65.7
Bachelor	83	33.1
Postgraduate	3	1.2
Years of experience in nursing		
1–5 Year	133	53
6–10-Year	86	34.3
11 Year above	32	12.7
Employment status		
Indefinite duration contract	76	30.3
Definite duration contract	175	69.7
Working hours/week		
≤ 45 hours	53	21.1
> 45 hours	198	78.9
Nurse/patient ratio		
1:1	46	18.3
1:2	59	23.5
1:3	146	58.2
Working in a private place in addition to your current job		
Yes	196	78.1
No	55	21.9
Attendance of any incident reporting educational activity		
Yes	33	13.1
No	218	86.9

Table (2): Distribution of the nurses' awareness regarding the incident reporting system

Statements	Number (%)
The availability of a reporting system for incidents.	
Aware	62 (24.7)
Not aware	189 (75.3)
Did you fill out the incident form before?	
Yes	30 (12)
No	221 (88)
Know how to use an incident form.	
Know	67 (26.7)
Do not know	184 (73.3)
Did you fill in an incident in the last month?	
Yes	0(0)
No	251 (100)
What to do with the completed incident form?	
Know	28 (11.2)
Do not know	223 (88.8)

Table (3): Distribution of the barriers to incident reporting as perceived by nurses

Barriers	Strongly Disagree/ Disagree		Neutral	Strongly Agree/ Agree	
	N (%)	N (%)	N (%)	N (%)	N (%)
1.I'm afraid of disciplinary action.	15 (6)	12 (4.8)	0 (0)	62 (24.7)	162 (64.5)
2.I'm afraid of legal consequences.	13 (5.2)	14 (5.6)	6 (2.4)	62 (24.7)	156 (62.2)
3.I don't want to get in trouble.	15 (6)	12 (4.8)	0 (0)	82 (32.7)	136 (54.2)
4.I'm sure that they'll track me down, even if I don't write my name.	30 (12)	15 (6)	12 (4.7)	62 (24.7)	132 (52.6)
5.I'm not confident they're keeping the form anonymous.	14 (5.6)	30 (12)	19 (7.6)	58 (23.1)	130 (51.8)
6.Junior nurses are often, unfairly, accused and blamed for adverse incidents.	22 (8.8)	36 (14.3)	10 (4)	55 (21.9)	128 (51)
7.My co-workers may be unsupportive.	30 (12)	26 (10.4)	45 (17.9)	34 (13.5)	116 (46.2)
8.I'm worried about who else will know about the incident I report (stigma & guilt).	19 (7.6)	30 (12)	52 (20.7)	34 (13.5)	116 (46.2)
9.With a heavy workload, I forget to fill out the incident report if there is any error.	34 (13.5)	38 (15.1)	33 (13.2)	32 (12.7)	114 (45.5)
10. The form used to report the incident requires a long time because it is too long and I don't have this time.	29 (11.6)	30 (12)	56 (22.3)	27 (10.8)	109 (43.4)
11. I'm not going to have the case discussed at the meeting.	41(16.3)	42 (16.7)	30 (12)	36 (14.3)	102 (40.6)
12. I'm not sure who's responsible for filling the report.	34 (13.5)	60 (23.9)	19 (7.6)	36 (14.3)	102 (40.6)
13. The incident form of the hospital is too complicated and requires too much detail.	41(16.3)	23 (9.2)	56 (22.4)	33 (13.1)	98 (39)
14. I don't get any feedback on what actions are taken if I make an incident.	41(16.3)	23 (9.2)	56 (22.4)	33 (13.1)	98 (39)
15. Reporting someone else's mistakes isn't my responsibility.	14 (5.6)	12 (4.8)	112 (44.5)	22 (8.8)	91 (36.3)
16. I don't think we have anything else to do while discussing the case with the person concerned.	29 (11.6)	33 (13.1)	78 (31)	23 (9.2)	88 (35.1)
17. A system change that would increase the quality of care is unlikely to result from incident reporting.	29 (11.6)	33 (13.1)	78 (31)	23 (9.2)	88 (35.1)
18. If the incident does not eventuate or correct, then I don't see any benefit in reporting it.	33 (13.1)	34 (13.5)	78 (31.1)	18 (7.2)	88 (35.1)
19. The incident was insignificant.	19 (7.6)	50 (19.9)	83 (33.1)	65 (25.9)	34 (13.5)

Table (4): Nurses' suggestions to solve the barriers and improve incident reporting

Suggestions For Improvement	Strategies
Reduce fear, worries, and burden of incidence reporting.	- Develop a support environment for the reporting and feedback of incidents. - Use the incident reporting system, which shall be confidential, anonymous, voluntary, and web-based. - Promote a blame-free environment.
Increase the nurses' awareness about incident reporting and how it is considered a part of patient safety culture in the critical care units.	- Consider the incident reporting system as a part of the orientation program conducted for newly hired nurses. - Develop a concise booklet to improve the nurses' awareness and knowledge of reportable incidents and address fear of disciplinary action. - Distribute these booklets to all nursing heads of units, nurse unit managers, and patient safety managers. - Place simple colorful posters explaining the incidents in the critical care units and handover places, nursing staff rooms, and nurses' stations.

Suggestions For Improvement	Strategies
Improve the incident reporting system culture.	- Create an incident reporting culture. - Provide adequate resources to support the incident reporting system process. - Provide adequate staff with professional competence and empowerment. - Simplify the procedure, e.g., by making a call or filling out an electronic, or paper-based standard incident reporting form. - Promote a blame-free environment.
Build a positive attitude toward the reporting.	- Allow to report the incident anonymously. - Orient the nurses on how the incident report will be managed. - Calify how the results of the incident report have changed the safety culture system.
Overcome the economic burdens.	- Increase the nurses' salaries to overcome the economic burden and find no need to work in private sectors and to avoid the physical and mental fatigue that compromises the patient safety culture in the critical care units.
Adhere to the ideal nurse-patient ratio.	- Hire new nurses to reduce adverse events and provide an opportunity to report the incidents.

Table (1): Reveals the personal and clinical characteristics of the nurses. The survey was completed by 251 nurses (response rate = 100%). More than half of the nurses were aged 20 – 25 years old (51.8%), females (68.5), and had 1 – 5 years of experience (53%). Moreover, more than two-thirds of the sample had a diploma degree (65.7) and worked more than 45 hours per week in governmental and private healthcare sectors (78.1%) and nearly two-thirds had definite-duration contracts (69.7%). Furthermore, more than half of the sample (58.2%) had been assigned to 3 critically ill patients per shift, and a vast majority of the sample did not attend any in-service education about incident reporting (86.9%).

Table (2): Illustrates nurses' awareness of incident reporting. The current finding revealed that less than one-quarter of the nurses showed awareness regarding the existence of a system for reporting an incident (24.7%), and only 12% of the nurses filled out an incident report. Moreover, slightly more than one-quarter of the sample (26.7%) knew how to access the incident form. No one of the nurses had filled out an incident report during the last month, and only 28 (11.2%) nurses out of 251 knew what to do with the completed incident form.

Table (3): Portrays incident reporting barriers as perceived by nurses. These barriers can be categorized according to their levels of significance that were extracted from the nurses' levels of agreement and perceptions. The first category was concerned with fear and worries. A vast majority of the nurses were worried about disciplinary action (89.2%), were worried about legal consequences (86.9%), they did not want to get into trouble (86.9%), afraid of being tracked down (77.4%), I'm not confident they're keeping the form anonymous (74.9%), Junior nurses are often, unfairly, accused and blamed for adverse incidents (72.7%). Nurses were worried about who else is going to get the information they disclose (stigma) (59.7%), and fear of unsupportive behavior of their colleagues (59.7%). The second category was concerned with workload and limited time. A heavy workload was reported by 59.7% and limited time was agreed by 54.9%. The third category was related to organizational, administrative, and system barriers, e.g., the nurses did not know who was responsible for filling the report (54.9%), 52.1 found that the incident form of the hospital was too complicated and required too much detail, did not get any feedback on what actions are taken if I make an incident was agreed by slightly more than fifty percent of the nurses (52.1%), 113 out of 251 were agreed that reporting someone else's mistakes isn't their responsibility, nothing was done if the incident discussed or highlighted (system change) was equally perceived and agreed by 42.3%, and finally, no need to report the incident if it was not significant was agreed by the least percentage of the nurses (39.4%).

Table (4): represents the suggestions mentioned by the nurses to improve the incident reporting culture in the critical care units. it can be noticed that five suggestions were raised by the nurses including reducing fear, worries, and burden of incidence reporting, increasing the nurses' awareness about incident reporting, and how it is considered a part of

patient safety culture in the critical care units, improving the incident reporting system culture, building a positive attitude toward the reporting, overcoming the economic burdens, and adhering to the ideal nurse-patient ratio.

Discussion

International attention has been paid to reducing medical errors. Several countries around the world have consistently shown high rates of medical injuries and preventable deaths. Incident reporting by the Critical Came Unit healthcare provider is one of the solutions to this problem. The cornerstone of safety practice and a measure of progress toward the establishment of a safety culture is an efficient reporting system. The reporting of incidents can help to detect threats and risks, as well as provide information about system failure. To reduce the risk of future patient injuries, this can help focus on improvements and change systems.

The Personal Characteristics of the Nurses

The current study attempted to put a spotlight on the barriers that hindered the creation of an effective incident-reporting safety culture by nurses. These barriers have hindered the movement towards an efficient safety culture for nurses who participate in incident reporting, affecting their performance, thinking, and attitude. In addition to exploring the nurses' suggestions for strategies to improve the incident reporting safety culture. The main findings of the current study indicate that there is a long way ahead to achieve an effective and positive incident reporting safety culture. The demographic characteristics of the nurses support this saying.

The current study results showed that the majority of the nurses who participated in the current study were, females aged between 20-25 years old, had diploma degrees, worked more than 45 hours per week, worked in private sectors, and were assigned to 2 to 3 critically ill patients per shift. To be females, no problem with this as female nurses are dominant in the profession all over the world, however, the number of males admitting to the profession is growing. According to Bureau of Labor Statistics data from 2023 and the American Association of Colleges of Nursing, men account for almost 12% of all licensed practical nurses, and nurse practitioners.

Over the last 10 years, there's been a 59% increase in nurses who are men. Moreover, nurses who have a diploma degree are almost the double of nurses who have a bachelor's degree, and this is contrary to what was mentioned by the World Health Organization **WHO (2019),** the Institute of Medicine IOM (2011), and the study that was conducted by **Lasater (2022)** recommended to increasing the percentage of BSN graduates to 80%. This recommendation is based on evidence that higher hospital proportions are associated with better safety and health outcomes for patients. Additionally, they recommended that hospital leaders be given the confidence to continue increasing the employment of BSNs **(Lasater et al., 2022)**.

A nurse-to-patient ratio is one of the contributing factors that determine the patient's outcome. Regarding the nurse-patient ratio, the current study showed that more than fifty percent of nurses were assigned to three patients per shift. This finding contradicts the International Council of Nurses (ICN) which recommended that the nurse-to-patient ratio should be 1:1 in the intensive care unit **(Sharma & Rani, 2020).** In addition, about three-quarters of the nurses worked more than 45 hours per week, most of them worked in the private sector. This may be attributed to low nurses' salaries. Nurses, males or females, have economic obligations that push them to work in other private places. Working more than 45 hours per week contributed to physical and mental exhaustion. There is a strong link between physical exhaustion and lack of attention and concentration. Physical fatigue (PF) negatively affects postural control, causing mental fatigue, decreased balance performance, and concentration, and increased incidence of medical errors and adverse effects. To successfully carry out every day and job-related activities, physical and mental balance is a prerequisite **(ABEER et al., 2020; As et al., 2021; Banda et al., 2022; Gebel et al., 2022).**

The nurses' awareness of incident reporting

As regards the nurses' awareness of incident reporting, the finding of the current study showed that only one-quarter of nurses knew about the availability of a reporting system for incidents. Additionally, a vast majority of the sample had not filled in an incident form. Moreover, more than two-thirds of the sample did not know what to do with the completed incident form. Inadequate nurses' level of awareness could be explained by the fact that the majority of the nurses did not attend any incident reporting educational activity and the other barriers, some of which were mentioned in the survey, and the others were reported by the nurses in their answers to the open-ended question about the other barriers that were not captured in the questionnaire. The result of nurses' awareness is inconsistent with other several studies **(Oweidat et al., 2023).**

Barriers hindered the incident reporting system

The most significant barriers that hindered the nurses' incident reporting as perceived and reported by nurses were lack of awareness, fear, worries, workload, limited time, and other organizational and administrative-related barriers (such as an unsupportive environment, lack of resources, etc,).

Lack of awareness or knowledge regarding incident reporting is previously discussed in the above section. Fear and worries were the second most significant barriers to incident reporting. According to the nurses, they were fear and worried about disciplinary action, they did not want to get into trouble, they were worried about litigation, they feared from tracked down, and they feared blaming especially the junior staff who were unfairly blamed for the adverse incident, and they were worried about if they would be supported by their colleagues. The nurses also mentioned that not only the nurse who committed the incident was feared and worried but head nurses were also afraid and worried that it might make their departments look bad or worried about getting themselves into trouble. The nurses mentioned that most head nurses do not appreciate the reporting. They consider it as a criticism and stigma in their administrative role. The nurses mentioned that we cannot fill any incident report without permission from the head nurses, otherwise, we will be punched "They mentioned that "the head nurse will try to find any small mistake to punish me. They will make us hate our job". So that without administrative support, incident reporting could not be adopted. Additionally, because nurses believed that it might harm their colleagues, they preferred not to report the incident because they believed that reporting incidents is a betrayal.

Workload and limited time were perceived by the majority of the nurses as significant barriers that hindered them from implementing incident reporting. This finding is supported and explained by many theories and studies **(ABEER et al., 2020; Almenyan et al., 2021; As et al., 2021; Banda et al., 2022; Gebel et al., 2022; Kovacs & Lagarde, 2022).** They found that nurses with heavy workloads may not have enough time to perform tasks safely, implement safe practices, or monitor patients, and this can reduce their interactions with doctors and other health professionals, such as taking little time to double-check medications. Moreover, nurses who work a lot of hours may find that they are less motivated to achieve the best results contributing to developing an unfavorable attitude towards their profession. Additionally, a heavy workload contributes to errors in decision-making and a high cognitive workload can lead to errors such as slips and omissions or errors (eg, high cognitive workload-forgetting to administer medications). Finally, the quality and safety of patient care may be jeopardized by excessive workload conditions making it difficult for nurses to comply with rules and guidelines, such as insufficient hand washing in patients. Moreover, nurses who have a high workload may suffer from stress and exhaustion which can affect their performance. Other barriers hindering incidence reporting are organizational and administrative barriers such as the incident report being too long and complicated, nothing would be changed if the nurses filled out the incident reporting, etc.

The barriers described in this study were consistent with several discussions of barriers to implementing a patient safety culture. The barrier of fear of disciplinary action is consistent with a study carried out in Saudi Arabia suggests that the fear of disciplinary action should be reduced through the use of an anonymous reporting system (Mohammad et al., 2016). In another study conducted by Choi et al, The participants shared stories of overwhelming workloads, not having enough time to attend to patients, and even experiencing emotional reactions like guilt, shame, depression, sleeplessness, avoidance, and changing careers **(Choi et al., 2019a).** Another barrier highlighted that incident reporting was associated with legal issues, as well as concerns about criticism from supervisors and colleagues **(Askarian et al., 2020).** Additionally, the study conducted by Boussat identified poor knowledge, lack of resources, and nurses as barriers to incident reporting **(Boussat et al., 2018).** In addition, the negative effect of job changes on burnout has been shown as another obstacle **(Dhamanti et al., 2019).** Moreover, Golle et al., have identified four main barriers to error or incident reporting by nurses working in critical care units, including legal problems and organizational failures, feelings of insecurity, blame, and lack of management support in identifying the main causes of medical errors **(Golle et al., 2020).** Workplace dissatisfaction is perceived as a barrier. Nurses reported that the impact of reporting should include positive learning and change, protocol review, peer empathy and support, feedback, and follow-up **(Harrison et al., 2019).** Several recommendations are mentioned in many studies to improve incident reporting. The supervisor must create an encouraging and supportive environment that allows non-punitive reporting of medication errors to prevent future incidents. **(ABEER et al., 2020; Hamed & Konstantinidis, 2022; Kamil, 2023; Naome et al., 2020; Oweidat et al., 2023; Oyenike & Ibukunoluwa, 2019).**

Suggested solutions to solve the barriers and improve the reporting of incidents or adverse effects

In addition to, the data collected by quantitative survey, the group interviews with the nurses highlight the other barriers that were not captured in the survey and suggested solutions. Group interviews using open-ended questions help nurses to explore and clarify their views. This enhanced understanding will be useful if efforts are made to improve the incident

reporting system. The current study provided common solutions to overcome the barriers including reporting anonymously, providing feedback about what happened, creating an incident reporting culture, making the procedure more simple, promoting a blame-free environment orienting the nurses regarding what and how to report, increasing the nurses' salaries, and hiring new nurses to overcome the heavy workload and adhering to the ideal nurse-patient ratio in the critical care units. the finding of the current study is consistent with other several studies **(Choi et al., 2019b; Naome et al., 2020; Varallo et al., 2018).**

Conclusion

Based on the results of the current study, the most significant barriers were lack of awareness (incident reporting-related knowledge), fear and worries, workload, limited time, and other organizational or system barriers. Additionally, nurses mentioned several suggestions to solve those barriers such as reporting anonymously, providing feedback, creating an incident reporting culture, making the procedure more simple, promoting a blame-free environment orienting the nurses regarding what and how to report, increasing the nurses' salaries, and hiring new nurses to overcome the heavy workload. These suggestions should be considered by the hospital authorities and decision-makers when making an effort to improve incident reporting.

Recommendations

Recommendation for Nursing Practice

- Present and announce the barriers to incident reporting in the workplace and the suggested strategies to solve and overcome these barriers to the policymakers and quality managers.
- Reduce fear, worries, and burden of incidence reporting.
- Increase the nurses' awareness about incident reporting and how it is considered a part of patient safety culture in the critical care units.
- Improve the incident reporting system culture.
- Build a positive attitude toward the reporting.
- Overcome the economic burdens.
- Adhere to the ideal nurse-patient ratio.

Recommendation for Nursing Research

Conduct further studies to address other patient safety issues and challenges such as high workloads and stress related to the work environment, level of staffing, and satisfaction.

Recommendation for Nursing Education

Include the incident reporting safety culture and other patient safety issues in the critical care nursing courses syllabus, theory, and practicum.

Declaration of Conflicting Interests

The Authors have declared that no competing interests exist.

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