



Healthcare Providers' Awareness of Occurrence Variance Reports and Their Magnitude at Accredited Versus Non-Accredited Hospitals: A Cross-Sectional Descriptive Study

Mohamed Gamal Elsehrawy¹, Samia Gaballah², Ateya Megahed Ibrahim³ & Hind Abdullah Mohamed⁴

1. Nursing Department, College of Applied Medical Sciences, Prince Sattam Bin Abdulaziz University, Kingdom of Saudi Arabia. Lecturer of Nursing Administration, Faculty of Nursing, Port Said University, Egypt.
2. Assistant Professor of medical surgical Nursing, Faculty of Nursing, Suez Canal University.
3. Nursing Department, College of Applied Medical Sciences, Prince Sattam Bin Abdulaziz University, Kingdom of Saudi Arabia. Assistant professor of Family & Community Health Nursing, Faculty of Nursing, Port Said University.
4. Assistant Professor of Nursing Administration, Faculty of Nursing, Port Said University.

ABSTRACT

Adverse incidents are a global issue and constitute the leading cause of death, although many are preventable. Patient safety is a significant challenge faced by healthcare professionals in hospitals. It is an essential element of high-quality care, which can negatively cause a deficiency in reporting clinical incidents. Healthcare professionals report only 1-3% of clinical incidents. **Aim:** This study investigated healthcare providers' awareness of occurrence variance reports and their magnitude at accredited versus non-accredited hospitals. **Material and methods:** A cross-sectional descriptive design was used. Three hundred seventy-three healthcare providers participated in the study (232 staff nurses, 96 physicians, and 45 pharmacists). They were recruited using a convenience sample from two universal health insurance hospitals in Port-Said, Egypt. **Data collection tools:** The Occurrence Variance Report (OVR) awareness questionnaire and OVR (paper-based forms) were used to report incidents in the two hospitals, with 522 from the accredited hospital and 258 from the non-accredited hospital. **Results:** It pointed out that healthcare providers in the accredited hospital had the highest awareness mean score of occurrence variance report (224.53) compared to non-accredited hospitals (153.47). Also, the accredited hospital had a higher frequency of all occurrence variance report classifications than a non-accredited hospital, with near misses being the most common (170) than other types, followed by sentinel events (148), major events (109), and occurrences (95). **Conclusion:** The total score of awareness dimensions and the total score of OVR frequency reported by all healthcare providers in the two hospitals had a moderately significant relationship ($r = 0.283$ at $p = 0.045^*$). **Recommendations:** Implement policies that organize safe cultural behaviors, such as writing occurrence variance reports and holding frequent training sessions on the importance of incident reporting. Furthermore, more research is suggested to identify factors and barriers influencing the OVR system.

Keywords: Awareness, magnitude, healthcare providers, occurrence variance reports.

Introduction

Adverse incidents are a global issue that constitutes the leading cause of morbidity and mortality (Birkeli, Jacobsen, and Ballangrud, 2022). However, 34% to 83% of cases are preventable (Schwendimann, Blatter, Dhaini, Simon, & Ausserhofer, 2018).

Healthcare organizations are complex systems with a wide range of potential risks that can jeopardize patient safety, considered the foremost challenge handled by nursing personnel within healthcare organizations and an essential indicator of healthcare quality (Albarrak et al., 2020). This is negatively affected by the deficiency of adverse clinical incident reporting, as only 1-3% are reported by healthcare professionals (Mns, Napoli, & Health, 2022).

In high-income countries, one in ten patients experiences an adverse incident while receiving hospital care. While in developing nations, available evidence indicates that up to one in four patients is vulnerable to harm, and 134 million adverse incidents resulting from substandard care occur every year, leading to around 2.6 million deaths (WHO, 2021), where 60% of deaths are recognized to unsafe and low-quality care (Kruk et al., 2018). This leads to more than 8 million deaths annually in low and middle-income countries, leading to economic welfare losses of \$6 trillion (Kruk et al., 2018). According to data from research conducted in the Eastern Mediterranean and Africa, 80 percent of incidences are preventable and cause deaths in

nearly 30 percent of patients with adverse incidents (WHO, 2011).

Patient safety aims to prevent and reduce the possibility of injury, errors, and harm while delivering healthcare services (Amanian, Faldaas, Logan, & Vaismoradi, 2020). Healthcare providers play crucial roles in the safety and quality of patient care at work. To prevent and adequately manage adverse incidents and deliver safe patient care, healthcare providers must be competent in knowledge, skills, values, and attitudes (Moran, Harris, & Valenta, 2016).

Healthcare providers must be able to identify patient safety events, conduct patient safety analyses using protocols, work in a team, learn from mistakes, and identify actions and recommendations for preventing patient safety incidents. Awareness about hospital incident management is crucial because it provides healthcare providers with the tools, information, and skills needed to ensure high-quality care and informed decisions about prevention, diagnosis, treatment, care, and support (Amanian, Faldaas, Logan, & Vaismoradi, 2020).

Hospitalized patients are the most vulnerable to incidents due to their illnesses' consequences, procedures, and effects of the medications (Shawahna, Abbas, & Ghanem, 2019). Incidents in the healthcare delivery system are unavoidable, multifaceted, and long-term threats to patient safety (Hashemi, Nasrabadi, & Asghari, 2012). Incident reporting is essential to improve patient safety and enhance nurses' awareness about

preventing potential errors through leadership, commitment, documentation, and the use of a proper reporting system. Occurrence reports document incidents that may breach patient safety or quality of care (**Tatum & Kumar, 2021**).

An occurrence variance report (OVR) or incident report is a principal administrative tool for ongoing risk identification as it provides comprehensive facts about an incident or adverse event. Occurrences are classified as 1) *A sentinel event* which is an unanticipated incidence including the death or serious physical or psychological harm, or risk thereof, containing loss of limb or function, signaling the need for immediate examination and response (**Alreshidi, 2014**), 2) *A major event* that did not affect the outcome but for which a recurrence carries a significant chance of a severe adverse outcome, 3) *near miss* which did not affect the outcome (by chance or intervention), but for which a recurrence carries a significant chance of serious adverse outcomes, and finally, 4) *an occurrence* that is defined as any event or circumstance that deviates from established standards or care (**Commission, 2006**).

"Variance" measures anything that does not fit the hospital organization's norms or competent practices. Variance is considered an unintended, unexpected incident in a healthcare setting that results in adverse incidents such as damage, harm, or malpractice claims (**Amanian, Faldaas, Logan, & Vaismoradi, 2020**). Moreover, **Al-zain and Althumairi (2021)** reported that incident

reporting permits the appreciation of sentinel events, near-misses, and potential malpractice threats. Therefore, hospitals should set clear guidelines that guarantee the prevention of recurrence.

Implementing an occurrence variance reporting system (OVR) to collect and document information about patient incidents can help to avoid or manage incidents and is considered an essential element in enhancing safety and quality of care (**Albarrak et al., 2020**). An OVR is a form to document the details of an occurrence, the investigation of the occurrence, and the corrective actions taken. The goal was to create a systematic, standardized hospital-wide mechanism for identifying and preventing events that directly or indirectly impact patient care and pose a risk to patients, visitors, volunteers, trainees, employees, and the facility (**Stavropoulou, Doherty, & Tosey, 2015**). Regrettably, factors that hinder healthcare providers from finding OVR involve time constraints, work pressure, lack of instructions, forgetfulness, unclear processes, the complexity of the reporting system, systems not providing confidentiality, lack of feedback, peer pressure, fear of job loss or superior punishment (**Aboshaiqah, 2013**). Understanding the causes of underreporting healthcare occurrences may help identify necessary corrective actions (**Al-zain & Althumairi, 2021**).

Proper implementation of OVR can provide useful data and help organizations improve their safety practices. If staff fail to report due to a lack

of awareness and fear of repercussions, the goals of providing patients safe, high-quality care and services will be jeopardized. All healthcare providers must report all occurrences of variability and promote positive hospital safety outcomes. According to **Brondial et al. (2019)**, a well-designed e-OVR system significantly improves the effectiveness and efficiency of any healthcare risk management system. As a result, every healthcare organization must ensure that all providers know all occurrence variations.

Despite the numerous studies that highlighted the positive impacts of OVR and its efficiency all around the world (**Alreshidi,2014; Schwendimann et al.,2018; Albarrak et al., 2020; Afolalu,2021; Gluschkoff et al.,2021**). But this issue has not been given enough attention in Egypt. There is a need to establish a workflow for reporting significant occurrences in hospitals and meet the demand for an effective and efficient healthcare system. Therefore, maximizing OVR awareness among healthcare providers is crucial to improving care quality and patient safety. Thus, the current study investigates the healthcare providers' awareness and magnitude of occurrence variance reports at accredited versus non-accredited hospitals.

Aim of the Study

To investigate healthcare providers' awareness of occurrence variance reports and their magnitude at accredited versus non-accredited hospitals.

Research Objectives

1. Determine healthcare providers' awareness of the OVR at accredited and non-accredited hospitals.
2. Assess OVRs' usability magnitude by the various healthcare providers at accredited and non-accredited hospitals.
3. Explore the relationship between healthcare providers' awareness and OVRs' usability magnitude.

Subjects and Methods

Study Design and Setting

A cross-sectional descriptive correlational design study was used in this study. The survey was conducted at two hospitals. One of the hospitals was accredited (El-Nasr Hospital), and the other was not accredited (As-Salam Port Said Hospital) in Port-Said, Egypt. Data were collected within six months, from February to July 2021.

Subjects

A convenience sample of 373 healthcare providers participated in the study; 232 staff nurses, 96 physicians, and 45 pharmacists. Participants were recruited after explaining the study's aim, significance, and assurance about the confidentiality of the data. All participants signed written informed consent. Healthcare professionals with more than one year of experience in a working site and available during data collection were included. Participants from the accredited

hospital were 176, and participants from the non-accredited hospital were 197.

Data Collection Tools

Data was collected using the OVR awareness questionnaire, which the researchers developed after reviewing relevant literature (**Schwendimann et al., 2018 & Albarrak et al., 2020**). The questionnaire was divided into two parts: personal characteristics as age, gender, level of education, occupation title, marital relationship, and years of expertise, and 84 items divided into six domains: 1) purpose and usability of the OVR (18 items); 2) circumstance and practices of the OVR (20 items); 3) role of healthcare provider (11 items); 4) corrective action taken (7 items); 5) barriers to OVR documentation (18 items), and 6) management perception belief regarding OVR (10 items). Also, the researchers reviewed OVR (paper-based forms) that were applied for reporting all incidents in the two hospitals, with 522 from the accredited hospital and 258 from the non-accredited hospital in the last year.

Scoring System

A modified five-point Likert scale with a strongly disagree (1) to strongly agree (5) range was used to score each item. The mean score was calculated by dividing the sum of item scores by the total number of items. The averages and standard deviations were calculated, and the percent score was determined. The level of awareness would be high if the score were higher than 75 %. The moderate level ranged between 50

and 75 percent, while the low level was lower than 50 percent based on the cut-off- points.

Tool's Validity and Reliability

The questionnaire was developed in English, and a language expert member followed the translation retranslation method to develop the Arabic version of the tool. Five experts reviewed the tool's content validity in nursing administration and medical-surgical fields in the faculty of nursing at Port Said University. Necessary modifications were made according to the expert's judgment to ensure sentence clarity and content appropriateness. It was done for the primary format of the data collection tool. The tool's reliability was measured using Cronbach's Alpha with a 0.87.

Pilot Testing

The study tool were pilot tested to determine their clarity and level of applicability, as well as the time required for completion; a pilot study was conducted on 10% of the study sample (37 healthcare providers). The main study sample was made up of participants in the pilot study. The pilot study's data analysis was conducted. No modifications and suggestions from participants were added to the questionnaire.

Fieldwork

A self-administered questionnaire was disseminated to 450 study subjects. Only 398 questionnaires were returned, and 25 were omitted because of incomplete data. Finally, 373

questionnaires which considered completed remained included in the study. The researchers collected data from healthcare providers who attended the previously selected settings two days per week from 10 a.m. to 5 p.m. Data was collected within six months, from February to July 2021. The researchers met participants individually in the waiting areas of the study settings and explained the study's aim after introducing themselves. The data collection tool was an anonymous self-administered questionnaire distributed as a paper-based questionnaire filled out by healthcare providers. The required time to complete the questionnaire was about 15–20 minutes.

Ethical Considerations

Ethical approval was granted from the Ethical Committee Ref. No. NUR (6/11/2022) (19), Faculty of Nursing, Port-Said University. Official approval to conduct the assigned hospital administrators gave this research. All participants signed written informed consent after explaining the study's aim and significance. The anonymity of the participants was assured and maintained. No coercion or pressure was applied to the participants, and no risk or burden was imposed on them to join the research. Participants were also informed of their right to withdraw from the study or decline participation. The confidentiality of data gathered was declared to be used for research purposes only.

Statistical Analysis

The statistical package SPSS v. 22 was utilized for data analysis. A one-sample Kolmogorov–Smirnov test tested the data normality. Qualitative data was labeled using numbers and percentages. Continuous variables are shown as the mean and standard deviation for parametric data. Also, a chi-square test was used. For nonparametric data, the Mann-Whitney test for comparing two un-matched groups, the Kruskal-Wallis's test for comparing more than two un-matched groups, and the Spearman coefficient correlation was also used. A significance level was considered at 0.05.

Results

Table 1 presents participants' characteristics and means scores of healthcare providers at accredited and non-accredited hospitals. The results indicate that more than half of healthcare providers were from the non-accredited hospital (52.8%). And most of them were female, subordinate, married, staff nurses, and had a bachelor's degree (73.5%, 79.9%, 66.5%, 62.2%, and 57.9%). About two third of them (66.2%) were in the age group of 30 to less than 50 years old, had years of experience of 10 to 15 (36.7%), and 41.6% had less than five years of experience in their working place. Moreover, 35.1% of them work in inpatient units. Furthermore, the table reflects that there was a significant relationship at level (0.05) between awareness and gender (1.02), with a higher mean score for female nurses and marital status (5.97) with a higher mean score for divorced nurses at accredited hospitals. No

significant relationship was found between the mean awareness score and the study sample's characteristics at a non-accredited hospital.

Table 2 shows healthcare providers' awareness regarding OVR at accredited and non-accredited hospitals. It was noted that healthcare providers in the accredited hospital had the highest awareness mean rank of occurrence variance report (224.53) compared to healthcare providers in a non-accredited hospital (153.47) with a statistically significant difference of $P < 0.001$. The highest mean score was 55.5 ± 7.93 for awareness of the purpose and usability of the incident reporting system, followed by a mean score of 52.5 ± 6.50 for barriers to writing an occurrence variance report, while the awareness of corrective action taken had the lowest mean score of 22.9 ± 4.32 . Furthermore, there is a statistically significant difference in all dimensions of awareness between the two settings.

Figure 1: Awareness levels of different health care providers regarding the occurrence variance report illustrates that the highest percent (77.8%) of pharmacists had a moderate level of awareness regarding the occurrence variance report, followed by 72.9% of physicians. In comparison, nurses had the lowest percentage (69.8%). Meanwhile, 20.7% of nurses had a low level of awareness, followed by 18.8% of physicians, while pharmacists had the lowest percentage at 17.8%. On the other hand, nurses had the highest percentage (9.5%) of high awareness level of occurrence variance, followed

by 8.3% of physicians. Meanwhile, 4.4% of pharmacists had a high awareness level.

Table 3 reveals healthcare providers' incident reporting at accredited and non-accredited hospitals last year. This table shows that the most significant percentage of pharmacists, physicians, and nurses (46.22%, 38.5%, and 35.7%) reported filling out one to two occurrence variance reports. In contrast, a lower percentage of them filled out 11–20 occurrence variance reports in the accredited hospital. Meanwhile, in a non-accredited hospital, most (68.4%, 68.2%, and 61.9%) did not complete any occurrence variance reports, and a lower percentage completed 6–10 reports. Additionally, the different healthcare providers analyzed the highest occurrence variance reports in accredited hospitals compared to non-accredited hospitals. There was a statistically significant difference between the two hospitals regarding physicians and nurses.

Figure 2 shows the occurrence variance report classifications at accredited and non-accredited hospitals throughout the last year. The figure illustrates that accredited hospitals had a higher frequency of all occurrence variance report classifications than non-accredited hospitals, with near misses being the most common (170) than other types, followed by sentinel events (148), major events (109), and occurrences (95). A sentinel event is the most common type of non-accredited hospital event (123), followed by an occurrence (67), a major event (45), and a near miss (23).

Table 4 clarifies the occurrence variance report categories frequency at accredited and non-accredited hospitals over the last year. The table depicts that clinical practice/procedure is the most frequent category (112) in an accredited hospital, followed by the patient care category (96) and then the medication and safety category (72 and 65, respectively). In contrast, the least frequent category was the occupational occurrence variance report(8). The most common category at the non-accredited hospital was medication occurrence variance report (81), followed by clinical practice/procedure (68), and then safety (49), with occupational occurrence variance report (1) being the least frequent. According to the table, the highest OVRs (299 and 164) were approved for analysis in the two hospitals, followed by 63 and 31 incomplete OVRs, and the lowest numbers

were 15 and 3 on-holds in the quality management department.

Table 5, the total score of awareness dimensions and the total score of OVR frequency reported by all healthcare personnel in the two hospitals had a moderately statistically significant relationship ($r = 0.283$ at $P = 0.045^*$). In addition, there was an association between the frequency of OVR reported in an accredited hospital and the role of healthcare providers and management belief in occurrence variance reporting aspects (0.295 & 0.313, respectively) of awareness. The frequency of OVR reported in non-accredited hospitals was negatively related to the purpose and usability of the incident reporting system and barriers to writing occurrence variance report aspects (-0.058, -0.014) of awareness.

Table (1): Personal characteristics and their relation to the mean awareness score of the studied healthcare providers at accredited and non-accredited hospitals (n = 373).

Personal Characteristics	No.	%	Awareness at accredited Hospital (176)		H P-value	Awareness at a non-accredited hospital (197)		H P- value
			Mean	SD		Mean	SD	
Age in Years								
>20	22	5.9	267.1	30.77	H=1.85 P=0.23	228.2	8.98	H=3.73 P=0.07
20 : >30	65	17.4	270.8	16.53		228.4	14.74	
30 :> 40	122	32.7	267.4	25.91		224.5	16.05	
40 : >50	125	33.5	269.1	19.93		221.1	17.99	
50: 60	39	10.5	270.2	11.63		218.2	11.97	
Mean±SD	39.89±7.35							
Marital status								
Single	98	26.3	272.3	16.77	H=5.97 P=0.05*	221.2	17.45	H=2.94 P=0.18
Married	248	66.5	267.7	22.54		225.1	16.71	
Divorced	20	5.4	281.0	18.51		218.3	15.68	
Widowed	7	1.8	252.0	41.01		224.8	7.66	

Personal Characteristics	No.	%	Awareness at accredited Hospital (176)		H P-value	Awareness at a non-accredited hospital (197)		H P-value
			Mean	SD		Mean	SD	
Educational level								
Diploma education (nursing school)	29	7.8	261.7	23.74	H=3.82 P=0.09	222.5	15.89	H=4.019 P=0.081
Technical education	87	23.3	271.7	15.73		224.7	16.45	
Bachelor's degree	216	57.9	270.1	22.62		222.9	16.74	
Master	30	8.0	259.9	24.31		224.0	19.13	
PhD	11	2.9	265.1	25.88		244.0	0.707	
Gender								
Male	99	26.5	267.5	24.56	$\chi^2=1.02$ P=0.05*	221.3	14.83	$\chi^2=0.92$ P=0.63
Female	274	73.5	269.1	20.91		224.7	17.53	
Experience in years								
>5 years	59	15.8	264.1	26.05	H=2.12 P=0.19	218.6	14.61	H=2.24 P=0.29
5 to >10 years	132	35.4	266.5	21.68		225.2	19.96	
10 to 15 years	137	36.7	280.1	11.52		224.3	15.45	
< 15 years	45	12.1	265.2	22.28		221.5	13.54	
Experience in years at the current place								
>5 years	155	41.6	269.2	21.62	H=2.92 P=0.09	225.1	18.59	H=2.43 P=0.37
5: >10 years	129	34.5	263.2	21.33		221.4	14.45	
10-15	70	18.8	279.2	14.08		225.4	17.71	
More than 15 years	19	5.1	267.1	26.89		218.6	9.76	
Occupation								
Staff Nurse	232	62.2	269.8	21.09	H=0.07 P=0.09	222.4	15.57	H=0.95 P=0.16
Pharmacist	45	12.1	268.9	23.77		221.5	17.29	
Physician	96	25.7	270.3	12.61		224.2	15.26	
Your current position								
Director	75	20.1	271.5	17.14	$\chi^2=1.09$ P=0.58	221.6	14.55	$\chi^2=1.32$ P=0.47
Subordinate	298	79.9	268.1	22.64		224.1	17.18	
The working site at the hospital								
Operating room	51	13.7	272.1	20.95	H=4.29 P=0.08	223.2	18.78	H=3.38 P=0.35
ICU	70	18.8	267.6	24.91		220.2	14.08	
Inpatient units	131	35.1	270.1	23.04		228.1	18.16	
Clinics	46	12.3	271.5	13.42		223.2	15.15	
Emergency	21	5.6	260.8	20.29		215.1	15.91	
Reception – triage	9	2.4	249.3	37.85		231.2	17.45	
Pharmacy	45	12.1	267.5	17.89		218.3	10.52	

*Significant (P<0.05). χ^2 = chi-square test. H= Kruskal-Wallis's test.

Table (2): Healthcare providers' awareness regarding OVR at accredited and non-accredited hospitals

(n = 373).

Awareness Dimensions	Accredited Hospital (176)			Non- Accredited Hospital (197)			U	P value
	Mean	SD	Mean rank	Mean	SD	Mean rank		
Purpose and usability of the incident reporting system	55.5	7.93	228.99	31.2	8.59	149.48	63.45	0.000**
Circumstances and practices of occurrence variance report	51.1	8.44	219.38	32.6	6.57	158.07	45.37	0.000**
Role of healthcare provider	39.8	5.53	213.53	21.6	6.51	163.30	29.67	0.000**
Corrective action taken	22.9	4.23	212.23	15.8	3.65	162.56	25.19	0.000**
Barriers to writing occurrence variance report	52.5	6.50	254.08	33.6	6.53	127.07	55.30	0.000**
Management perceived belief regarding occurrence variance reports	30.3	5.69	243.24	21.5	5.56	136.76	74.38	0.000**
Total	248.1	27.48	224.53	201.8	19.46	153.47	64.31	0.000**

** Statistically Significant (P<0.001). U stands for the Mann-Whitney test. The percentage represents the actual percentage in the same hospital.

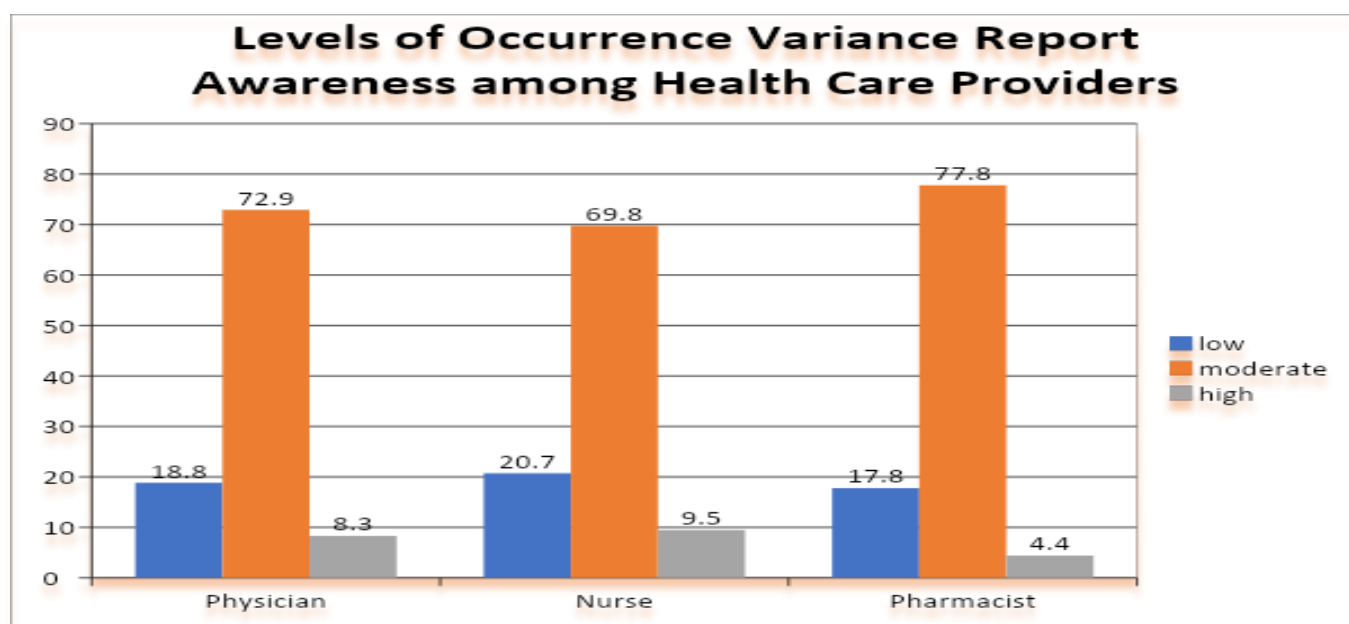


Figure (1): Awareness levels of different healthcare providers regarding the occurrence variance report (n = 373).

Table (3): Healthcare providers' incident reporting at accredited and non-accredited hospitals last year (n = 373).

Questions	Accredited Hospital			Non-Accredited Hospital			U	P value
	Physician	Nurse	Pharmacist	Physician	Nurse	Pharmacist		
In the past 12 months, how many OVRs have you filed?								
None	34.6	31.6	30.8	68.2	61.9	68.4	H1=	P1=
1-2	38.5	35.7	46.2	22.7	23.9	15.8	12.422	0.029*
3-5	11.5	19.4	7.7	6.8	10.4	10.5	H2=	P2=
6-10	9.6	9.2	7.7	2.3	2.2	5.3	19.174	0.002*
11-20	1.9	3.1	3.8	0	0.7	0	H3=	P3=
More than 20	3.8	1.0	3.8	0	0.7	0	8.029	0.155
Do you analyze OVR that others submit?							H1=6.609	P1=0.013*
Yes	69.2	62.2	69.2	43.2	31.3	26.3	H2=21.89 5	P2=0.000*
No	30.8	37.8	30.8	56.8	68.7	73.7	H3=8.091	P3=0.007*

*Significant ($P < 0.05$). U stands for the Mann-Whitney test. The percentage represents the actual percentage within the occupation. H1: comparison of two physician groups; H2: comparison of two nurse groups; and H3: A comparison between two groups of pharmacists

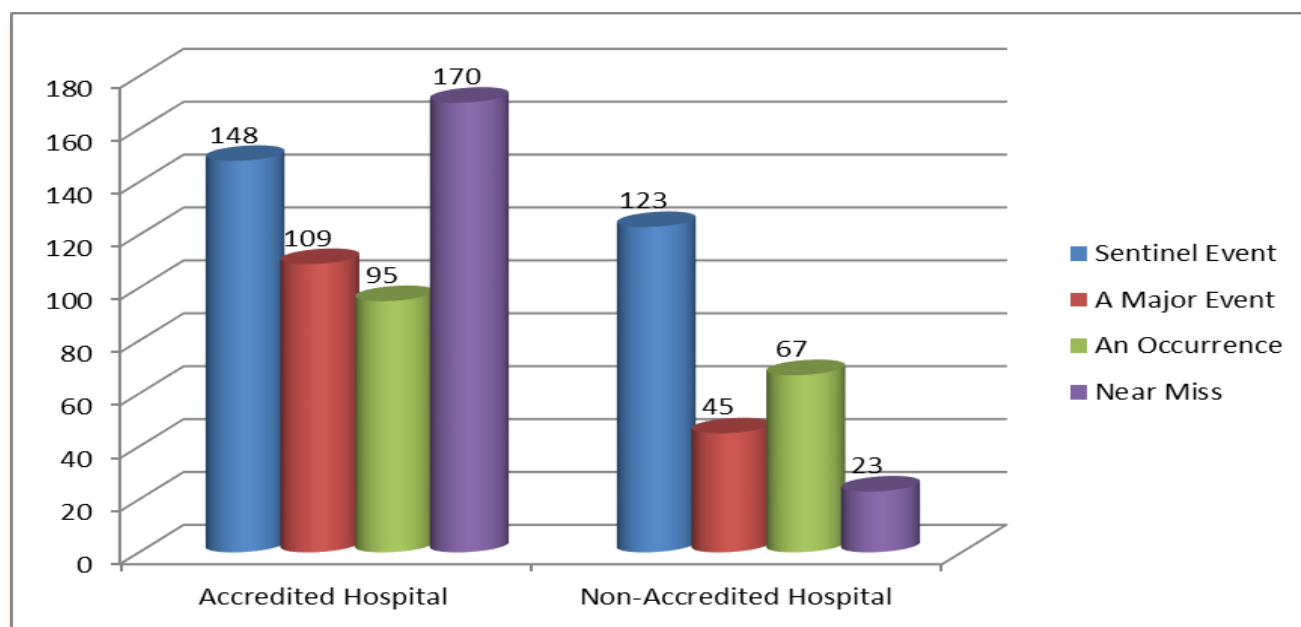


Figure (2): Occurrence variance report classifications throughout the last full year at accredited and non-accredited hospitals.

There are (522) paper-based forms from the accredited hospital and (258) from the non-accredited hospital.

Table (4) Occurrence variance report categories and statistics frequency at accredited and non-accredited hospitals over the last full year (780).

Occurrence Variance Report Categories Frequency	Accredited Hospital (522)	Non-Accredited Hospital (258)
Clinical Practice/Procedure	112	68
Medication	72	81
Watcher – Family – Visitor	43	17
Employee - Workers	39	9
Supplies - Equipment	16	8
Principles of Safety	65	49
Fire/Security	19	7
Behavioral	52	6
Patient Care	96	12
Occupational	8	1
OVR reported by hospital departments in the following areas		
Pending	53	19
Put On-Hold in QMD	15	3
Incomplete OVR	63	31
Rejected OVR	42	28
Withdrawn by Reporter	50	13
Approved for analysis	299	164

QMD: Quality Management Department

Table (5): Correlation between healthcare providers' awareness and OVR frequency at accredited and non-accredited hospitals correlation between healthcare providers.

Awareness Dimensions		OVR reported in Accredited Hospital	OVR reported in Non-Accredited Hospital	OVR reported by all healthcare providers
Purpose and usability of the incident reporting system	R	0.065	-0.058-	0.276
	P	0.167	0.218	0.048*
Circumstances	R	0.152	0.076	0.041

Awareness Dimensions		OVR reported in Accredited Hospital	OVR reported in Non-Accredited Hospital	OVR reported by all healthcare providers
and practices of occurrence variance report	P	0.096	0.104	0.412
Role of healthcare provider	R	0.295	0.052	0.334
	P	0.042*	0.266	0.017*
Corrective action taken	R	0.149	0.168	0.280
	P	0.119	0.143	0.046*
Barriers to writing occurrence variance report	R	-0.003	-0.014	0.113
	P	0.945	0.759	0.098
Management perceived belief regarding occurrence variance reports	R	0.313	0.107	0.299
	P	0.019*	0.158	0.037*
Total	R	0.243	0.157	0.283
	P	0.088	0.118	0.045*

* Statistically significant at p 0.05, r = Spearman coefficient

Discussion

Patient safety issues and reducing adverse incidents have become critical elements in healthcare (Silber et al., 2019). OVR by healthcare specialists is a routine procedure used in many healthcare systems worldwide; these reports can potentially improve patient safety by influencing care practices, knowledge, and attitudes (Scott et al., 2018).

The current study results revealed a significant relationship between awareness and gender, and marital status at an accredited hospital. No significant relationship was found between the mean awareness score and participants' characteristics at a non-accredited hospital.

According to the results, the healthcare providers in the accredited hospital had the highest

mean rank of occurrence variance compared to healthcare providers in a non-accredited hospital with a statistically significant difference. The highest mean score was for awareness of the purpose and usability of the incident reporting system, followed by barriers to writing an occurrence variance report. The awareness of corrective action taken had the lowest mean score. Also, there is a statistically significant difference between the two settings regarding all dimensions of awareness.

This result may occur because accredited hospitals may have more policies that organize safe cultural behaviors, including writing occurrence variance reports and holding frequent training sessions regarding awareness of incident reporting importance. The non-accredited hospital also has issues that contradict documenting occurrence variance reports, such as fear of blame, lack of knowledge, and occurrence of punishment.

Along the same line, the study conducted at King Saud Hospital (not accredited then), Al Qassim, KSA, revealed that no OVRs were reported during most months. During six months of data collecting, just 15 reports were made, despite being reported during the bulk of the months. This relates to a lack of permanent staff to implement the OVR system; a lack of staff readiness and awareness regarding incident reporting; a lack of staff education on the OVR process; a lack of proper staff orientation; a lack of knowledge of the policy by staff; a lack of OVR forms in the units; a fear of punishment; a lack of feedback provided to the reporting department; and a lack of managerial support (Alreshidi, 2014).

Oppositely, Shaikh (2018) studied the impact of hospital accreditation on the number of OVRs and found that the occurrence variance reports before accreditation were higher than after accreditation status. Also, there is a significant difference in the mean occurrence variance report before and after accreditation. Also, at King Khalid University Hospital (2012), there was

evidence of under-reporting of incident reports compared to accredited hospitals of similar size. Also, Al-jury (2020) found that the number of OVRs gradually decreased in reported errors over three years (2017-2019) at Hamad Medical Corporation in Qatar (an accredited healthcare organization).

The present study results revealed that pharmacists had the highest scores (moderate plus high) of total awareness compared to others, followed by physicians and nurses in the two hospitals. This result may be occurred due to the high recognition given by the physician to the concept of safety and trying to decrease errors, then the nursing staff, which included in the direct care procedures with patients and getting more attention in the process of error detection and prevention, followed by pharmacists who provide indirect care practices.

Supporting these results, Brondial et al. (2019) identified that electronic system has significant benefits making them more convenient for all healthcare providers. Physicians' and pharmacists' awareness of OVR was higher than others. Sentinel occurrences, adverse events, and near misses all continued to rise in number. A well-designed OVR system significantly enhances the effectiveness and efficiency of any healthcare risk management system.

Albarrak et al. (2020) studied to identify barriers to electronic OVR use in the emergency department at King Khalid University Hospital (accredited hospital) in Riyadh, Saudi Arabia. The researchers reported that only one-third of participating nurses and physicians stated that they have minor problems related to patient safety errors. The following result also evidences this as only 22% of nurses and 28% of physicians feel the person is being focused on, not the problem, when they report an event. Finally, those staffs provide high importance to three issues: discussing ways to prevent errors, feeling free to speak up and report incidents, and safety being a priority. Awareness

regarding OVR becomes high, and the culture of safety becomes dominating.

Alreshidi (2014) concluded that there were essential enhancements in reporting OVRs between two stages, pre & post. The enhancements may be attributable to the training program's impact on raising hospital personnel and administrators' understanding of the OVR system and its significance for the facility, employee, and patient safety. Additionally, the policies were updated and publicized, and non-punishment culture was utilized.

The current result reveals that the highest percentage of pharmacists, physicians, and nurses reported filling out one to two occurrence variance reports in the accredited hospital. While in non-accredited hospitals, most did not complete any occurrence variance reports. Also, the highest percentage of occurrence variance reports were analyzed in accredited hospitals compared to non-accredited hospitals. There was a statistically significant difference between the two hospitals regarding physicians and nurses.

The explanation for these results may be that the accredited hospital has a system for filling out the occurrence variance report. Also, several policies control this practice; the accredited hospital constructed a pathway after writing the occurrence variance report to analyze it and take corrective action. The non-accredited hospital seems not to have the proper system for managing the practice of filling out occurrence variance report and analyzing it.

Alreshidi (2014) stated that, concerning a hospital (not accredited at that time), the nursing department reported the most OVRs ($n = 389$ OVR) of any department. The information service, pharmacy, social service, diabetic security, housekeeping, physiotherapy, transportation, waste management, medical supplies, and respiratory treatment did not report any OVRs. The number of OVRs received was 611 OVRs. In another study, nurses were the highest personnel group filling the OVR, followed by physicians and technicians. At

the same time, the lowest category of people who didn't fill out OVR is social workers (**King Khalid University Hospital, 2012**).

Harper and Helmreich (2005) conducted a study at two University of Texas System hospitals. The researchers reported that a low percentage of physicians and nurses did not submit an incident report to a hospital system; however, most know the hospital has a mandatory system for reporting incidents. Moreover, only one-quarter were involved if it resulted in an investigation of an incident or root cause analysis.

Regarding the classification of occurrence variance reports, the results found that the accredited hospital had a higher frequency of all occurrence variance report classifications than a non-accredited hospital, with near misses being the most common than other types, followed by sentinel events, major events, and occurrences. The most common type of non-accredited hospital event is a sentinel event, followed by an occurrence, a major event, and a near miss.

These results supported the findings of **Shaikh(2018)**, which stated that both stages before and after the accreditation stage have the highest frequency occurrence variance reports for medication errors. In contrast, the lowest frequency occurrence variance reports were sentinel events followed by organizational errors followed by fire safety.

Fukami et al. (2020) concluded that incident severity reported by medical doctors was high percent at 64%, while near-miss only appeared at 36%. While the report by **King Khalid University Hospital (2012)** identified that occurrence reports were the high category of OVR types, and the low frequency of reports was sentinel events. Furthermore, the study conducted at Hamad Medical Corporation showed that the overall classification of reported errors was 95% were pre-analytical errors, 2% and 3% of errors were

analytical and post-analytical, respectively; Also, most incidents under this category were related to systemic errors that include quality control issues and equipment errors that account for 82.8% and 17.2% respectively (Al-Jurf, 2020). Alreshidi, 2014 found that the highest number of reported incidents were related to equipment and supplies (n= 16). However, no incidents were reported concerning intravenous and sentinel events (n = 0). Those results could be attributed to fear of punishment and no feedback from the reporting department.

Regarding the categories and statutes of occurrence variance reports, the study finding depicts that clinical practice/procedure is the most frequent category in an accredited hospital, followed by the patient care and safety categories. In contrast, the least frequent category was the occupational occurrence variance report. The most common category at the non-accredited hospital was medication occurrence variance report, followed by clinical practice/procedure, and then safety, with occupational occurrence variance report being the least frequent. Also, the highest numbers (299 and 164) of OVR in the two hospitals were approved for analysis, followed by 63 and 31 incomplete OVR, while the lowest numbers were 15 and 3 on hold in the quality management department.

Albarrak et al.(2020) found that nursing staff and physicians complained of absent or delayed feedback. While AlReshidi, 2014 reported that most incidents at the first follow-up stage, according to the classification, were related to behavior (n=93). In comparison, the lowest number of incidents were related to intravenous. Moreover, at the second follow-up stage, most incidents were related to equipment and supplies (n =73 incidents). However, no occupational incidents were reported. Hospital staff becomes encouraged to report incidents because of being not punished when reporting occurrences.

King Khalid University Hospital reported that during 2012 a total of 2362 OVRs were reported to the Quality Management Department; patient care was the most occurring OVR, followed by Clinical Practice/Procedure, while the lowest was Occupational incidents. Most OVRs were ended by the closed incident (1151), and (959) are pending OVRs. At the same time, only (32) OVRs were rejected.

Finally, the study results revealed a positive correlation in the accredited hospital between the healthcare provider's role and management's perceived belief regarding occurrence variance reports. In contrast, there is no correlation with healthcare providers' awareness in a non-accredited hospital. But regarding all healthcare providers, there is a significant positive correlation between awareness and frequency of OVR reported by all healthcare providers in all dimensions except; circumstance and practices of occurrence variance report and barriers to writing occurrence variance report.

Conclusion & Recommendations

This study concluded that healthcare providers in the accredited hospital had the highest awareness mean rank of OVR compared to non-accredited hospitals. The physicians had the highest mean score of total awareness compared to others, followed by nurses. The accredited hospital had a higher frequency of all OVR classifications and categories than a non-accredited hospital, with near misses being the most common type, followed by sentinel events, major events, and occurrences. Finally, the total score of awareness dimensions and the total score of OVR frequency reported by all healthcare providers in the two hospitals had a moderately significant relationship.

Continuous staff training, assistance, and feedback seem necessary to enhance awareness and support reporting and documentation.

Manage barriers to applying OVR in hospitals. Motivate and support healthcare providers, specifically in non-accredited hospitals, to facilitate reporting or being reported. Adopting a simplified template and modifying the overall process will improve reporting errors and minimize intra and inter-individual expressions of errors. Future studies conducted with larger samples in a multicenter setting are recommended. Future studies could investigate the usability and support for describing safety events and its association with associated with non-reporting of safety events and its association with non-reporting of safety events.

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