Assessing Patient Safety Culture and Adverse Events Reporting Among Nurses: A Cross-Sectional Study in Ghana

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ABSTRACT

Introduction: Patient safety is a global concern for both health professionals and the public. Research indicates that assessing patient safety culture can help improve patient safety outcomes. Nursing care strategically positions nurses at the center of patient safety promotion, and their proximity to patients makes them the drivers of patient safety. The actions of frontline staff in healthcare organizations have a notable influence on healthcare outcomes, particularly reporting of adverse events. This study aimed to evaluate the actions of frontline staff on adverse event reporting among nurses in three hospitals in the Savannah Region, Ghana. **Methods:** A quantitative cross-sectional method was used to gather data from 210 respondents across three hospitals. Data were analyzed with descriptive statistics, Pearson correlation, and hierarchical linear regression. **Results:** The findings revealed that teamwork within units had a good positive rating score of 82.9%. This was followed by teamwork across hospital units (68.0%) and handover of care (69.8%). Overall, nurses demonstrated a negative attitude toward adverse events reporting (37.3%). Furthermore, enacting safety practices that had a significant relationship with adverse events reporting were teamwork across units ($r = .24$, $p < 0.001$) and handover and transition of patient care ($r = .19$, $p < 0.001$). Again, the significant predictor of adverse events reporting was teamwork across units ($\beta = .20$, $p < 0.001$). **Conclusion:** Nurses' perceptions of patient safety culture within and across hospital units as well as handover of patient care were positive. Though the attitude of nurses toward adverse event reporting was low, teamwork across hospital units significantly predicted adverse event reporting. Therefore, frontline staff should continually strengthen teamwork processes and handover practices to achieve the best healthcare outcomes.

Keywords: adverse events reporting, patient safety outcomes, patient safety culture, patient safety

INTRODUCTION

Patient safety, a positive concept, has been defined as the "prevention of errors and adverse effects associated with healthcare.[1] Prioritizing patient safety in healthcare settings not only reduces avoidable harm, improves care quality, and increases satisfaction, but also can reduce legal and operational costs and improve staff retention.[2] This can result in a more sustainable and financially sound healthcare organization. However, consistently meeting safety standards remains a global challenge.

Globally, estimates indicate that 1 in 10 patients suffers harm while on admission.[3] This translates to 427 million hospitalizations each year, resulting in 43 million negative occurrences experienced by patients during these periods. On average, statistics reveal that one patient sustains an injury every 35 seconds while seeking healthcare in the United Kingdom.[4] In low- and middle-income countries (LMICs), approximately 134 million adverse events are estimated to take place in hospitals owing to unsafe care and this leads to 2.6 million deaths annually.[5] Data from Ghana indicate that about 8.7% of Ghanaians are accidentally injured while seeking medical care.[6] This underreporting likely reflects a conservative estimate, influenced by a punitive and blame-oriented culture within the Ghanaian healthcare system. This environment fosters fear of repercussions, suggesting that the actual rate of harm may be higher than what is reported. This implies that patient safety is compromised at all levels (low-, middle-, and high-income countries), underscoring the importance of making it a global priority.

Safety culture plays a crucial role in determining patient safety. Patient safety culture is defined as "a set of shared values, attitudes, perceptions, beliefs, and behaviors that support safe practices among healthcare workers.[7,8] A robust safety culture is linked with higher client satisfaction.[9] Lack of a patient safety culture can lead to various negative health outcomes such as increased patient pain, prolonged hospital stays, readmissions, disability, and inpatient mortality.[3,10]

Vogus and colleagues[11] consider patient safety culture to be influenced by enabling, enacting, and elaborating practices Enabling a safety culture emphasizes leader actions that create a safe environment for people to voice out their concerns. Enacting entails identifying and effectively addressing safety concerns. Elaborating involves learning practices that influence safety outcomes and using the feedback and information gathered from these practices to enhance safety practices.

Frontline healthcare staff, such as nurses, are pivotal in shaping patient safety culture, particularly in reporting adverse events. Actions by frontline staff, including patient care handovers and teamwork, are thought to influence their reporting behavior. These actions create learning opportunities, and the insights gained can lead to changes in the behavior and practices of frontline staff. Effective adverse event reporting is a key component of safety culture. This concept allows healthcare professionals to openly and honestly report errors of commissions or omissions. Research indicates that openly reporting near misses and adverse incidents improves healthcare outcomes by enhancing patient safety, training, and decision-making.[12]

Although reporting adverse events is associated with better healthcare outcomes, evidence indicates that reporting rates are low in countries such as Ethiopia and Ghana.[13–15] This potentially underestimates the actual frequency of errors and incidents within the health system. In light of low rates of adverse event reporting among medical practitioners, most studies focused on high-income settings, making it critical to understand how these frontline staff actions affect adverse event reporting in low-income settings. Therefore, the study objectives are to assess enacting patient safety practices and to determine how these practices would predict adverse event reporting among nursing staff.

METHODS

The Institutional Review Board of Noguchi Memorial Institute for Medical Research approved the study. Additionally, permission was obtained from the authorities of the three district hospitals. Informed consent was obtained from all study participants, and all data were de-identified for privacy.

Study Design and Setting

This study used a cross-sectional approach to evaluate how safety practices influence adverse event reporting among nurses in three district hospitals in the Savannah Region, Ghana. The region's capital is Damongo and it has a total population of 649,627.[16] The study was conducted in three major hospitals, namely, Bole District Hospital, West Gonja District Hospital, and Salaga District Hospital. The hospitals serve as referral centers for many small healthcare facilities in the region. Among the hospitals, there are a total of 385 nurses with 119 nurses at Bole District Hospital, 133 at East Gonja Hospital, and 133 at West Gonja District Hospital. These hospitals have no adverse event reporting system either mandatory or voluntary.

Sample and Data Collection

Data collection took place over 2 months, from December 2019 to January 2020. The study recruited 216 nurses from a total population of 385 from three district hospitals. These nurses consisted of enrolled nurses, registered general nurses, and registered midwives. Respondents from the three hospitals were recruited using a ratio of 3:2:3 based on the nursing staff strength. The study included nurses who had at least 6 months of professional work experience, exhibited willingness to participate in the study, and were directly involved in caring for patients. Nurses who had fewer than 6 months of work experience were excluded from this study. This was because they might not have been familiar with the hospital's patient safety procedures. Quota sampling was used to recruit respondents from the selected hospitals. This was done to ensure that the population was adequately represented. However, it is worth noting that portion of the data used in this study, particularly the demographic information and enacting safety practices (teamwork and handover of patient care), is available through the University of Ghana repository.[17]

Study Tool

This study adapted the Hospital Survey on Patient Safety Culture (English version) developed by the Agency for Healthcare Research and Quality as a tool for data collection. The tool comprised 12 dimensions (42 items) and had Cronbach's alpha coefficient values between 0.63 and 0.8.[18] The tool includes a section for demographic information such as age, staff position, work area, work experience, and number of hours per week.

This study used three dimensions of the tool, which were more relevant to evaluating enacting safety practices among nursing staff. These dimensions consist of teamwork (within units [four items] and across units [four items]) and handover of patient care (four items). Each item was rated on a 5-point Likert scale where 5 = *strongly agree* and 1 = *strongly disagree*. The tool also includes an outcome variable, i.e., adverse event reporting (dependent variable), which required respondents to rate the frequency with which adverse events were reported, with 5 = *always* and 1 = *never*. The researchers distributed the tool to 216 nurses either before commencement of work or after each shift to prevent disruptions in the wards.

Data Analysis

The data were analyzed with both descriptive and inferential statistics, using Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics were used to examine respondents' demographic information, enacting safety practices, and adverse event reporting. This was presented by using frequencies, percentages, means, and standard deviations. Furthermore, inferential statistical analysis was also used, namely chi-square tests, Pearson correlation coefficient, and multiple linear regressions. Prior to analysis, the data distribution was assessed via a histogram, confirming adherence to the normal distribution curve. Again, the data were checked for any possible outliers. Hierarchical multiple regression analysis was conducted with adverse event reporting as an outcome variable and three enacting safety practice dimensions as predictor variables after controlling for respondent demographic variables. Prior to computing hierarchical multiple regression analysis, items within each subdimension were aggregated into a composite score, with negative items being reverse-coded as required. The predictor variables were used as linear predictors and a p-value < 0.05 was considered statistically significant.

Validity and Reliability

The tool's validity was confirmed by both its face and content validity. On face validity, the researchers restructured the questions to align with the study objectives. For content validity, a thorough literature review was conducted, and the study tool was carefully designed to cover all variables being examined. On reliability, the tool was pretested at Tamale West Hospital, Tamale, involving 20 nurses. This was done to ensure clarity or refine any unclear questions. The pretest indicated Cronbach alpha coefficient values for the tool, ranging from 0.62 to 0.91. After data collection, these values were reevaluated, and ranged from 0.64 to 0.83. Based on these findings, the researchers concluded that the study tool showed robust validity and reliability, making it suitable for evaluating frontline staff actions on adverse event reporting among nurse practitioners.

RESULTS

The response rate for this study was 97.2% (210 of 216). Among 210 (100%) nurses who participated in this study, most (55.2%) were men. Additionally, 50.0% held a certificate in nursing. Furthermore, 30.0% of the nurses (registered general or enrolled nurses) were assigned to work in the medical wards. Whereas 65.2% of the nurses had fewer than 5 years of experience working in the hospital, 95.2% working in their present wards (units) had work experience between 6 months and 5 years. Also, most (53.3%) nurses had a workload ranging from 40–59 hours per week (Table 1).

The findings reveal that all three enacting safety practices regarding patient safety had high response scores

Table 1. Respondents' demographic information

Respondents' Characteristics	Subcategory	n (%)
Age, y	24–29	80 (38.1)
	30–34	84 (41.4)
	≥ 35	43 (20.5)
Sex	Female	94 (44.8)
	Male	116 (55.2)
Qualification	Degree	34 (16.2)
	Diploma	71 (33.8)
	Certificate	105 (50.0)
Hospital work area	Medical unit	63 (30.0)
	Surgical unit	15 (7.1)
	Obstetrics & gynecology	40 (19.0)
	Pediatric unit	41 (9.5)
	Emergency unit	34 (16.2)
	Others	17 (8.1)
Experience working in the hospital, y	< 5	137 (65.2)
	5–10	58 (27.6)
	≥ 11	15 (7.1)
Experience working in the present unit, y	< 5	200 (95.2)
	5–10	8 (3.8)
	≥ 11	2 (1.0)
Hours of work per week	< 20	4 (1.9)
	20–39	73 (34.8)
	40–59	112 (53.3)
	60–79	10 (4.8)
	80–99	6 (2.9)
	≥ 100	5 (2.4)

(> 50%). Among these practices are handover and transition (69.8%), teamwork across units (68.0%), and teamwork within units (82.9%) (see Table 2).

In terms of adverse event reporting, the findings reveal that although 37.3% of nurse practitioners reported adverse events, a larger proportion (62.7%) did not report adverse events or were unsure if they had done so in the past (see Table 3).

The association between respondents' demographic information and adverse events reporting was examined with a χ^2 test. The findings indicate that sex had a statistically significant association with reporting of adverse events (χ^2 (1) = 4.14, p = 0.04), with 53.8% of nurses who are females showing a higher tendency to report adverse incidents. Moreover, there was a statistically significant association between the hospital work area and adverse event reporting (χ^2 (3) = 31.20, $p < 0.001$), with nurses in obstetrics and gynecology units (38.5%) more inclined to report adverse incidents than nurses in other units. Moreover, years of hospital work experience showed a statistically significant association with reporting of adverse events (χ^2 (2) = 12.72, $p < 0.01$). Nurses with at least 6 years or more of work experience (47.4%) considered reporting adverse events as an obligation (Table 4).

Table 2. Enacting safety practices

	Disagree/ Strongly Disagree		Neutral		Agree/ Strongly Agree		% of Positive Response Rate
	n	*%*	*n*	*%*	*n*	*%*	
Teamwork within the units							82.9
People support one another in this unit	12	5.7	22	10.5	176	83.8	83.8
When a lot of work needs to be done quickly, we work together as a team to get things done	12	5.7	12	5.7	186	88.6	88.6
People treat each other with respect in this unit	13	6.2	32	15.2	165	78.6	78.6
When one area in the unit gets really busy, others help out	18	8.6	23	11.0	169	80.5	80.5
Teamwork across the units							68.0
There is good cooperation among hospital units that need to work together	31	14.8	49	23.3	130	61.9	61.9
Hospital units work well together to provide the best care for patients	24	11.4	39	18.6	147	70.0	70.0
Hospital units do not coordinate well with each other	34	16.2	28	13.3	148	70.5	70.5
It is often unpleasant to work with staff from other hospital units	30	14.3	36	17.1	144	68.6	68.6
Handover and transition of care							69.8
Things are overlooked when transferring patients from one unit to another	45	21.4	22	10.5	143	68.1	68.1
Important patient care information is often lost during shift changes	33	15.7	20	9.5	157	74.8	74.8
Problems often occur in the exchange of information across hospital units	49	23.3	38	18.1	123	58.6	58.6
Shift changes are problematic for patients in this hospital	23	11.0	24	11.4	163	77.6	77.6

Pearson correlation analysis was performed to examine the association between enacting safety practices and adverse events reporting. The analysis revealed a statistically significant positive association between teamwork across units, handover and patient care transition, and adverse events reporting ($p < 0.01$). However, statistically, there was no significant association between teamwork within units and adverse events reporting ($p > 0.05$) (Table 5).

A hierarchical multiple regression analysis was conducted to ascertain if enacting safety practices and respondents' demographic information could predict adverse event reporting. It was found that teamwork across hospital units ($\beta = 0.19$, $p < 0.02$) significantly predicted adverse events reporting. However, respondent demographic information and handover of patient care did not show any statistically significant effect on adverse event reporting (Table 6).

DISCUSSION

Enacting Patient Safety Practices

This study assessed enacting safety practices among nursing staff. It also explored how these practices affect adverse event reporting. Enacting practices are nursing activities that identify safety threats and mobilize the needed resources to mitigate them. These activities comprise intra-unit teamwork, interunit teamwork, and handover and transition of patient care. Patient safety research has shown that implementing a teamwork approach in hospitals offers numerous potential advantages: enhanced communication, improved coordination of patient care, and reduced adverse events.[19] In this study, intra-unit teamwork recorded the highest (82.9%) average percentage positive response score of patient safety culture. The highest score reflects a strong teamwork attitude among nurse practitioners. This is an indication that nurses in the Savannah Region of Ghana work as teams, show respect, and provide the needed support for each other at their workplaces. Perhaps, the score attained by nurses could be linked to reported shortage of nursing staff in this study. This situation might have compelled nurses to enhance teamwork efforts to ensure safe patient care. Other studies confirm this study's findings, showing that intra-unit teamwork achieved the highest score for positive responses.[13,20]

In terms of interunit teamwork, findings from this study reveal that 67.7% of nurses believed that there was

Table 3. Frequency of adverse events reporting

	Never/ Rarely		Sometimes		Most of the Time/Always		% of Positive Response Rate
	n	*%*	*n*	*%*	*n*	*%*	
Frequency of adverse events reporting							37.3
When a mistake is made but is not caught and corrected, before affecting the patient, how often is this reported?	48	22.9	80	38.1	82	39	39.0
When a mistake is made but has no potential to harm the patient, how often is this reported?	79	37.6	72	34.3	59	28.1	28.1
When a mistake is made that could harm the patient, does not, how often is this reported?	53	25.2	63	30	94	44.7	44.7

Table 4. Frequency of adverse events reporting by respondents' demographic information

Variable	Category	Adverse Events Not Frequently Reported N = 132		Adverse Events Frequently Reported N = 78		χ^2	p
		n	*%*	*n*	*%*		
Age, y	24–29	54	40.9	26	33.3	1.29	0.53
	30–34	53	40.2	34	43.6		
	≥ 35	25	18.8	18	23.1		
Sex	Male	80	60.6	36	46.2	4.14	0.04
	Female	52	39.4	42	53.8		
Nurses' qualification	Degree	23	17.4	11	14.1	1.29	0.52
	Diploma	41	31.1	30	38.5		
	Certificate	68	51.5	37	47.4		
Hospital work area	Medical wards	83	62.9	36	46.2	31.20	< 0.01
	Obstetrics & Gynecology	10	7.6	30	38.5		
	Emergency ward	30	22.7	10	12.8		
	Others	9	6.8	2	2.6		
Experience of work in the hospital, y	< 1	31	23.5	21	26.9	12.72	< 0.01
	1–5	65	49.2	20	25.6		
	≥ 6	36	27.3	37	47.4		
Experience of work in the unit, y	< 1	60	45.5	33	42.3	0.82	0.32
	1–5	67	50.7	40	51.3		
	≥ 6	5	3.8	5	6.4		
Hours of work per week	< 40	51	38.6	26	38.3	1.37	0.51
	40–59	70	53.0	42	53.8		
	≥ 60	11	8.4	10	12.5		

effective coordination of patient care across hospital departments or units. In this regard, nurses can collaborate with other healthcare professionals whether within the same care setting or across different care settings for better coordination of patient care. Teamwork in other jurisdictions presents a challenge. For instance, in three Arabian countries (Jordan, Tunisia, and Libya), healthcare professionals were expressively dissatisfied with how the hospital units coordinated patient care.[21–23]

Transferring and sharing patient information during handover processes are crucial areas that can significantly affect patient healthcare outcomes if not managed effectively. Inadequate handling of patient information can lead to negative consequences such as delays or changes in patient management, thereby affecting both the patient's well-being and the hospital's reputation. In this study, 69.8% of nurses were satisfied with handover practices across the hospital units. This means that when

Table 5. Pearson correlation among the studied variables

Variables	1	2	3	4
1. Frequency of adverse events reporting	1			
2. Teamwork within units	0.12	1		
3. Teamwork across units	0.24**	0.48**	1	
4. Handover and transition of patient	0.19**	0.11	0.46**	1

**$p < 0.01$.

patients are transferred between nurses or hospital units and the handover process is carried out efficiently, vital patient care information is shared. The results of this study are consistent with studies conducted in hospitals in Korea and the United States by Yu et al[24] and Richter et al[25] where handover scores indicate a robust patient safety culture. However, other researchers have reported the lowest positive response score regarding handover of patient care.[26–28] Despite previous studies highlighting handover challenges, the positive attitude of nurses toward patient care handover in this present study deserves commendation. Therefore, implementing strategies like handover protocols and template-based guidelines can enhance the transfer of patient care information within and among hospital units, thereby strengthening handover practices in the region.

Reporting adverse events is pivotal for enhancing patient safety in hospital settings. However, this study reported a notable deficiency in adverse event reporting, with only 37.3% of incidents being reported. This means that fewer adverse incidents were documented. Perhaps, this outcome may likely stem from the punitive measures for reporting adverse events. Such punishment includes dismissal[29] or public shaming of staff.[30] Consequently, many healthcare professionals might be worried about the repercussions of reporting adverse events, prompting them to conceal their errors rather than reporting them to avoid potential

Table 6. Predictors of adverse events reporting

Predictors	Unstandardized Coefficients		Standardized Coefficients		
	β	SE	β	t	p
Model 1	8.71	0.49		17.63	< 0.001
Sex	0.46	0.39	0.08	1.20	0.23
Work area	0.13	0.12	0.07	1.07	0.29
Year of work experience	0.15	0.25	0.04	.59	0.56
Model summary: $R^2 = .02$, F (3, 206) = 0.94, $p = 0.42$					
Model 2	4.80	1.16		4.13	< 0.001
Sex	0.46	0.38	0.08	1.20	0.23
Work area	0.11	0.12	0.06	0.92	0.36
Years of work experience	0.16	0.25	0.05	0.67	0.51
Teamwork across the units	0.19	0.07	0.20	2.64	0.009
Handover and transition of care	0.07	0.07	0.08	1.05	0.29
Model summary: $R^2 = .53$, F (5, 204) = 3.01, $p < 0.01$					
R^2 change = 0.06, F (2, 204) = 6.90, $p = 0.001$					

SE, standard error.

disciplinary measures from supervisors. These concerns could hinder hospitals' ability to learn from past incidents and implement preventive measures. Similar studies have also revealed a lack of enthusiasm among healthcare workers for reporting adverse events, highlighting the need for urgent intervention.[31,32]

Predictors of Adverse Events Reporting

This study examined the influence of interunit teamwork and handover of patient care by nurse practitioners on reporting adverse events. The findings revealed that handover and transition of patient care as well as interunit teamwork had a statistically significant positive association with adverse events reporting. Other studies have indicated that reporting adverse events relied on handover of patient care and interunit teamwork.[33,34] This demonstrates the critical role teamwork and patient care coordination among hospital units play in promoting adverse event reporting. Therefore, neglecting these practices may result in poor communication, leading to the loss of crucial patient information among nurses across various hospital units, ultimately compromising patient safety.

Effective teamwork among hospital units emerged as a key predictor of adverse event reporting, as nurses' inclination to report such incidents was directly associated with interunit cooperation. This signifies that when hospital units demonstrate strong collaboration and efficient coordination, nurses are more inclined to identify potential adverse events, whether overtly or covertly, to mitigate attendance-related repercussions. The results of this study align with previous research where teamwork across units was a significant predictor of adverse event reporting.[35]

Study Limitations and Strengths

One key limitation of this study was failure of the authors to directly assess patient safety indicators like wound infections, injection abscesses, transfusion reactions, and errors in medication administrations, among others. As a result, the authors were unable to statistically demonstrate a connection between patient safety practices and reporting of individual adverse incidents. Furthermore, collecting data from nurses, using a structured tool like the Hospital Survey on Patient Safety Culture, limited respondents' ability to freely express their views on the phenomenon under investigation.

Despite such limitations, this study adapted a robustly reliable tool that has been extensively used to evaluate patient safety culture in healthcare facilities. Moreover, using a sample size of 210 respondents in this study could permit the authors to generalize the study findings to other healthcare settings although with caution.

Implications and Recommendations

In this study, nurses in clinical settings seem to be unaware of the role patient safety culture plays in healthcare outcomes. This is a knowledge gap in nursing, so well-structured formal patient safety culture education, training, and continuous development programs are required to provide nurses with the knowledge they need to improve patient safety in their organizations. To enhance adverse event reporting, managers of healthcare facilities must take the needed steps to address the concept of teamwork among nursing staff. Again, hospitals should develop standardized protocols and an open communication system for handover and transition of patient care. Implementing protocols such as Situation, Background, Assessment, and Recommendation (SBAR) can facilitate smooth patient care transfers, potentially encouraging nurses to admit errors or mistakes. Finally, the authors recommend that every hospital across the country should implement a structured, mandatory adverse event reporting system. This system should be user-friendly, confidential, and easily accessible to all healthcare staff. By doing so, hospitals can develop an effective reporting system that enhances patient safety and improves the quality of care.

CONCLUSION

In conclusion, this study examined how nurses in the Savannah Region of Ghana reported adverse incidents. Among all the enacting patient safety practices, intra-unit teamwork was rated highly by the nursing staff. Again, interunit teamwork significantly predicted adverse events reporting among nurses. This means when hospital units demonstrate strong collaboration and efficient coordination, nurses are motivated to identify potential adverse events, whether overtly or covertly and possibly report them to mitigate attendance-related repercussions.

Acknowledgments

Data Availability

A portion of data used in this study is available via the University repository and may be available upon reasonable request from the corresponding author.

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