

Patient Safety Culture in Radiodiagnosis Units: A Survey of Two Nigerian Tertiary Institutions

Okafor Chioma Henrietta^{1*} (MSc); Ugwu C Anthony² (PhD) Okon E Ime³ (MSc)

¹ Nnamdi Azikiwe University Teaching Hospital, Nnewi.

² Nnamdi Azikiwe University Okofia, Nnewi Campus.

³ Uyo Teaching Hospital, Cross river state Nigeria.

ARTICLE INFO	ABSTRACT
<p>Article type: Original Article</p> <hr/> <p>Article history: Received: 13-Oct-2017 Accepted: 8-Nov-2017</p> <hr/> <p>Keywords: Health Workers Nigeria Patient Safety Culture Radiodiagnosis</p>	<p>Introduction: Medical errors are inevitable adverse events in the field of health care, and the establishment of a safety culture could potentially improve patient safety. The present study aimed to evaluate the patient safety culture in the radiodiagnosis units of two tertiary centers in Nigeria.</p> <p>Materials and Methods: This study was conducted on the health workers in the radiodiagnosis units of Nnamdi Azikiwe University Teaching Hospital in Nnewi and University of Nigeria Teaching Hospital in Enugu, Nigeria during May-July 2017. Data collection tool was the hospital survey on patient safety culture (HSOPSC), a validated questionnaire by the Agency for Health Research and Quality (AHRQ). Data analysis was performed in SPSS version 17.</p> <p>Results: Response rate in the HSOPSC was 70%. In total, 55.4% of the respondents were radiographers, and 41.1% rated patient safety culture as favorable. The highest range of the reported events was 3-5 (28.6%). The composite with the highest positive response was 'teamwork within units' (81.3%), while the dimension of 'events reported' had the lowest frequency. Results of t-test indicated no significant association between the positive responses in the present study and benchmark of AHRQ.</p> <p>Conclusion: According to the results, the patient safety culture in the studied tertiary institutions was barely above average. Therefore, it is recommended that improvements be made in patient safety culture through emphasis on the dimensions of 'staffing', 'non-punitive response to error', 'communication openness', and 'frequency of events reported'.</p>

► *Please cite this paper as:*

Chioma Henrietta O, Anthony U, Ime O. Patient Safety Culture in Radiodiagnosis Units: A Survey of Two Nigerian Tertiary Institutions. *Patient Saf Qual Improv.* 2017; 5(4):621-624.

Introduction

Safety culture is a term that was first used in the Summary Report on the Post-accident Review Meeting on the Chernobyl Accident in 1988 (1). It is a process through which safety is managed in the workplace as reflected in the shared attitudes, beliefs, perceptions, and values of employees regarding safety (2).

Patient safety is defined as diminishing the risk of unnecessary harm to an acceptable level in healthcare procedures (3). Considering that medical errors are inevitable in medical practice (4), the establishment of a patient safety culture in healthcare organizations could potentially improve patient safety (3). Human error, environmental factors or technological failures are not the only causes of adverse medical events, and

organizational policies and standards have repeatedly been shown to predate catastrophe (5). It has been emphasized that patient safety is an aspect of healthcare delivery, which is non-negotiable as far as the welfare of Nigerians are concerned. Therefore, healthcare providers have been enjoined to prioritize patient safety in their practice (6).

Radiodiagnosis units are important sections in every hospital. In these units, various types of human, radioactive, and material resources are utilized to achieve accurate diagnosis. A high level of patient safety culture is required in these units as any error may lead to dispensing excess radiation, which is a major risk factor for cancer (7). Therefore, measuring the

level of patient safety culture practice in radiodiagnosis units is generally regarded as the first step toward the improvement of healthcare delivery (8).

In the current literature, most patient safety and quality improvement efforts have only been reported on an international level in the Nigerian pharmacy department in Bayelsa state.

The present study aimed to evaluate the level of patient safety culture in the radiodiagnosis units of two Nigerian tertiary centers and compare the results with the benchmark compiled by the Agency for Health Research and Quality (AHRQ) (9).

Materials and Methods

This prospective, cross-sectional study was conducted at the radiodiagnosis units of Nnamdi Azikiwe University Teaching Hospital in Nnewi and University of Nigeria Teaching Hospital in Enugu, Nigeria during May-July 2017. These tertiary institutions are located in the south-east of Nigeria. The choice of these hospitals was based on the fact that they are referral centers that employ the services of a large number of healthcare professionals across various units, including the selected units in the present study. Total population of the healthcare personnel in the radiodiagnosis units was estimated at 80, which was determined as the sample size of the research.

Data collection tool was the hospital survey on patient safety culture (HSOPSC) questionnaire, which has been developed by the AHRQ. The questionnaire was pilot tested and revised before its release in November 2004 (3). The reliability of HSOPSC has been confirmed at the Cronbach's alpha of 0.62-0.85 (range: 0.63-0.84) (10), demonstrating that the items and dimensions in the survey are psychometrically sound on the individual, unit, and hospital levels (11).

In addition, the validity of HSOPSC has been calculated at 61.57%. According to the AHRQ, the questionnaire could be used at a unit level, as well as a hospital level, with some variables eliminated at the unit level (nine remaining variables).

HSOPSC includes independent, dependent, and control variables. The independent variables at unit level are the 'overall perception of patient safety', 'management expectations and actions', 'communication and feedback', 'communication openness', 'staffing', 'teamwork within units', 'organizational learning-continuous improvement', 'frequency of events reported', and 'non-punitive response to error'. In this scale, patient safety culture is considered to be the dependent variable, and the control variables include age, gender, healthcare experience (years), education level, working hours per week, patient access, and staff position.

A pilot study was carried out with respect to the present study, and the Cronbach's alpha for the nine dimensions of patient safety culture were determined at a unit level (range: 0.29-0.76). With the Cronbach's alpha of 0.29, the dimension of 'management

expectations and actions) was eliminated from the study, and the other dimensions were further evaluated with the Cronbach's alpha of 0.50.

Data analysis was performed in SPSS version 17 using descriptive statistics for the demographic variables (n=8) of the respondents and t-test to assess the mean differences in the positives responses for comparison with the benchmark of the AHRQ. In all the statistical analyses, P-value of 0.05 was considered significant.

Results

In total, 80 questionnaires were distributed among the participants, and 56 questionnaires were completed with the response rate of 70%. Among the respondents, 50% were male, and 50% were female. In terms of the professional status, 55.4% of the respondents were radiographers, 14.2% were radiologists, 3% were nurses, and 25% were clerical staff.

The majority of the respondents (53.5%) had worked in the radiodiagnosis unit for 1-5 years. The longest working hours among the respondents (35.7%) was 1-19 hours.

In various units, 42.7% of the participants rated the patient safety level to be favorable. The highest number of the events reported was 3-5 as indicated in 28.6% of the responses. In addition, 19.6% of the responses demonstrated no reported events.

According to the information in Table 1, the highest positive response was in the dimension of 'teamwork within units', followed by 'communication and feedback', 'organizational learning-continuous improvement', and the components of the general perception of the safety culture. On the other hand, the lowest positive responses belonged to the dimension of the 'frequency of the events reported'.

Table1: Responses in Percentage

Variables	Positive Responses	Neutral Responses	Negative Responses
Teamwork within Units	81.3	8.5	10.3
Staffing	38.4	22.3	38.8
Organizational Learning-Continuous Improvement	70.2	14.3	15.5
Non-punitive Response to Error	39.3	23.2	37.5
Communication and Feedback	77.4	10.1	12.5
Communication Openness	47	12.5	40.5
Frequency of Events Reported	32.2	44.6	23.2
Overall Perception	60.4	12.3	27.3

According to the information in Table 2, there was no significant difference between the positive responses in the present study and the AHRQ benchmark.

Table 2: Mean Difference between Positive Responses of Stu

Variables	T-test	P-value
Present Study vs. AHRQ* (2016)	-1.933	0.095

*AHRQ: Agency for Health Research and Quality

Discussion

The present study was conducted at a unit level on the health workers in the radiodiagnosis units of two tertiary institutions in Nigeria. According to the literature, the adequate response rate in this regard is more than 60% (12), and the response rate in the current research was 70%. As our findings reflect the views of radiodiagnosis health workers toward the safety culture, they could lay the groundwork for the further implementation or improvement of various dimensions of the patient safety culture. It is also noteworthy that our study has been the first to be conducted in the aforementioned units in Nigeria. Nevertheless, the results need to be discussed with reference to the surveys at a hospital level in other healthcare sections in addition to radiodiagnosis units.

As a multi-disciplinary section, teamwork in radiodiagnosis units is essential to enabling effective work flow and the subsequent patient safety through utilizing all the available relating to human and material resources. According to the results of the present study, the highest score in patient safety culture belonged to the dimension of 'teamwork within units' (81.3%), which is in line with the study in (9) conducted at a hospital level on the health workers in all the hospitals in the United States using HSOPSC. Furthermore, our findings are consistent with the results in (3), which was research performed on 211 health workers in three major hospitals in Gambia, as well as a study in Iran (2), which was conducted at a hospital level to assess the current status of the patient safety culture in an Iranian hospital. In both mentioned studies, data were collected using the HSOPSC.

Another study in this regard (13) was carried out in the pharmacy unit of a tertiary hospital in Bayelsa state (Nigeria) on 25 pharmacy staff using a self-administered questionnaire. Similarly, the obtained results demonstrated the high rate of the teamwork components of the patient safety culture. Therefore, it could be concluded that teamwork is significantly effective in enhancing the patient safety culture in hospitals. The importance of this dimension could be attributed to the provision of care services, which requires efficient teamwork and cooperation on a daily basis in radiodiagnosis units.

According to the current research, the components of staffing (sufficient staff in proportion to the workload, working longer hours than necessary for the patients, employment of temporary staff, and working in crisis mode and providing rapid services within a short time) had a low rate of positive responses (38.4%). In contrast, employment was restricted in the studied tertiary centers due to not replacing the staff who failed

to provide the services, which might have contributed to poor staffing. Nevertheless, the finding is in congruence with the reports in (2) and (3). On the other hand, the rate of staffing with regard to the patients safety culture was reported to be slightly above average in (9) and (12).

In the present study, the positive responses were below average in the dimensions of 'frequency of events reported', 'non-punitive response to error', and 'communication openness', with the minimum values observed in the 'frequency of events reported'. In the studied health centers, the individual who made the error during the shifts would be written up instead of submitting the errors; as such, the staff members were concerned about reporting the adverse events in the unit. Other influential factors in the poor positive responses in this regard were derogatory health policies and oppression of some healthcare providers by their superiors (14).

Various health professionals were employed in the studied unit and were faced with the headship of a particular health professional occasionally against their wishes. Our findings are consistent with the study in (15) although it was conducted at a hospital level. Accordingly, it is imperative to enhance the mentioned areas by improving the healthcare system that supports submitting the errors instead of reprimanding the individual responsible for the error due to their work shift (9). It is also notable that the patient safety culture dimension of 'non-punitive response to error' has been reported to be below average in the AHRQ benchmark, as well as the study in (13), which was conducted among 25 pharmacy staff in a tertiary hospital in Bayelsa State (Nigeria) using a self-administered questionnaire to measure the practice of the patient safety culture in the hospital units.

Consistent with the AHRQ benchmark, the overall perception of the health workers in the current research toward the patient safety culture was above average (9). This implies that the health workers in the present study acknowledged the importance of the patient safety culture, which resulted in the proper collaboration and high positive response to the dimension of 'teamwork within units'.

The results of t-test showed no significant difference between the mean positive responses in the present study and AHRQ benchmark. Therefore, the patient safety culture in the current research was in accordance with the standards of the AHRQ; nonetheless, further improvement is required in some dimensions.

The implication of the present study is that patients may not be entirely safe in the selected healthcare units due to the high rate of the positive responses in the dimension of 'teamwork within units' and low rate of the positive responses in the dimension of 'non-punitive response to error'. Furthermore, the low rate of positive responses in the dimension of the 'frequency of events reported' indicated that the healthcare team members might cover adverse events, which is likely to

cause patient harm. Therefore, the patient safety culture must be properly addressed in the radiodiagnosis units of the studied centers. On the other hand, effective measures should be taken to prevent the dispensing of excess radiation, which is inevitable as the adverse events in this regard may lead to repeated or prolonged radiodiagnostic investigations.

Conclusion

According to the results, the patient safety culture dimensions of 'teamwork within units', 'organizational learning-continuous improvement', 'communication

and feedback about errors', and overall perception of the patient safety culture by the health workers were above average. Nevertheless, further improvement is required in the areas of 'staffing', 'non-punitive response to error', 'communication openness', and 'frequency of the events reported' in order to avoid the possible risks associated with radiodiagnosis.

Acknowledgement

Hereby, we extend our gratitude to the heads of the care units at the studied health institutions for assisting us in this research project.

References

- 1- Flin R, Mearns K, O'Connor P, Bryden R. Measuring safety climate: identifying the common features. *Safety science*. 2000 Feb 1;34(1-3):177-92.
- 2- Arabloo J, Rezapour A, Ebadi Fard Azar F, Mobasheri Y. Measuring patient safety culture in Iran using the Hospital survey on patient safety culture (HSOPS): an exploration of survey reliability and validity. *International Journal of Hospital Research*. 2012 Sep 1;1(1):15-28.
- 3- Barrow M. Measuring the Current Patient Safety Culture in the Gambian Public Hospitals. 2012 Jan 1:1-75.
- 4- Gadd S, Collins AM. Safety culture: A review of the literature. *Health and Safety Laboratory*; 2002.
- 5- Garbutt J, Waterman AD, Kapp JM, Dunagan WC, Levinson W, Fraser V, Gallagher TH. Lost opportunities: how physicians communicate about medical errors. *Health Affairs*. 2008 Jan;27(1):246-55.
- 6- Okoro OB. Marketing for Service Firms: Strategies for Improving Service Quality in Telecommunication Industry in Nigeria (Doctoral dissertation).
- 7- Shah DJ, Sachs RK, Wilson DJ. Radiation-induced cancer: a modern view. *The British journal of radiology*. 2012 Dec;85(1020):e1166-73.
- 8- Hoffmann B, Müller V, Rochon J, Gondan M, Müller B, Albay Z, Wepler K, Leifermann M, Miessner C, Güthlin C, Parker D. Effects of a team-based assessment and intervention on patient safety culture in general practice: an open randomised controlled trial. *BMJ Qual Saf*. 2014 Jan 1;23(1):35-46.
- 9- Famolaro T, Yount ND, Burns W, Flashner E, Liu H, Sorra J. Hospital survey on patient safety culture: 2016 user comparative database report. Agency for Healthcare Research and Quality; 2016.
- 10- Sorra JS, Nieva VF. Hospital survey on patient safety culture. (Prepared by Westat, under contract no. 290-96-0004). AHRQ publication no. 04-0041. Rockville, MD: Agency for Healthcare Research and Quality. 2004 Sep.
- 11- Chen IC, Li HH. Measuring patient safety culture in Taiwan using the Hospital Survey on Patient Safety Culture (HSOPSC). *BMC health services research*. 2010 Dec;10(1):152.
- 12- Cheikh AB, Bouafia N, Mahjoub M, Ezzi O, Noura A, Njah M. Patient's safety culture among Tunisian healthcare workers: results of a cross sectional study in university hospital. *The Pan African medical journal*. 2016;24.
- 13- Owonaro PA, Eneyi KE, Eniojukan JF. Pharmacy Patient Safety: 1. Evaluation of Pharmacy Patient Safety Culture in a tertiary _ hospital in Bayelsa State, Nigeria. *Sch. Acad. J. Pharm*. 2015;4(2):108-16.
- 14- Osaro E, Charles AT. Harmony in health sector: a requirement for effective healthcare delivery in Nigeria. *Asian Pacific journal of tropical medicine*. 2014 Sep 1;7:S1-5.
- 15- Al-Nawafleh A, Abu-Helalah MA, Hill V, Masoud MI, Al-Mahasneh HA, Al Salti ET. Patient Safety Culture in Jordanian Hospitals. *Health Science Journal*. 2016 Aug 16;10(5).