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Perception of Practicing Physicians on Medical Errors Disclosure in Government Secondary and Tertiary Health Facilities in Abuja Nigeria

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Abstract: Introduction: Prevention of medical error is important in ensuring the quality of patient care. The objective of this study is to compare the perceptions of physicians on the occurrence of medical errors and disclosure practices and to identify factors associated with the occurrence of errors and the barriers and motivations to disclosures. **Materials and Methods:** Eight focus group discussions (FGD) were conducted in six secondary and two tertiary health facilities. The facilities and participants were selected using cluster sampling and snowball techniques respectively. Qualitative data management was carried out using verbatim transcripts, followed by an interpretative account and finally summarization of coded themes. An observational checklist was used to identify drug prescription writing errors from 420 prescriptions, selected using a simple random sampling method. Quantitative data was analyzed using SPSS software. Chi-square test was used to assess associations between variables at a significance level of 5%. **Results:** Physicians' perceptions based on the FGDs suggests very frequent occurrences of medical errors and the main factor associated with occurrences was lack of hospital equipment. The secondary health facilities were more likely to disclose medical errors. Lack of disclosure policy and malpractice insurance was a major barrier to disclosure. The secondary health facilities had more frequent prescription writing errors than the tertiary facilities: omission of patients' age (75.2% > 33.3%; p=0.001); address (88.1% > 3.3 %; p=0.001). **Conclusion:** The physicians' perception was that of a heavy burden of medical error occurrences and poor disclosure practices. The development of institutional policies on disclosure including malpractice insurance should be encouraged.
Keywords: Physicians, Errors, Disclosures, Barriers, Motivations.

Introduction

The Canadian Safety Institute defines an error as a failure of a planned action to be completed as intended (i.e. error of execution) or the use of a wrong plan to achieve an aim (i.e., error of planning).[1] An error often results to an adverse event to the patient. Adverse events are the injuries or harms that result from an error in the course of the management of the patient rather than the underlying condition of the patient; usually as an unintentional and unexpected occurrence. Medical errors are therefore defined as preventable adverse medical events.[1]

A recognized classification of medical errors developed by the Canadian Safety Institute identifies the following broad categories of errors.[1] **"**Near misses" are errors that do not cause harm to patients by chance or because the error was corrected before harm could occur. "Mistakes" are errors in the

planning of an action. “Slips or lapses” are errors in the execution of an action that often occur as a result of distraction or momentary failure of concentration. “Technical errors” occur when there is a failure to carry out an action successfully even if the plan of action and technique are appropriate.[1]

The magnitude of the medical error problem from recent studies suggests that medical errors cause tens of thousands of avoidable impairments, disabilities, handicaps and deaths.[2,3] In Utah and Colorado, USA, survey data revealed a medical error rate of 2.9% while a medical practice study in Ontario, Canada showed that 3.7% of patients in hospitals suffered prolonged hospital stay or disability or both as a result of medical errors; 33% of which were considered preventable.[3,4] Annual deaths due to medical errors in the USA was estimated to be about 120,000 deaths annually and this is the fifth leading cause of death in the US, ahead of deaths due to all forms of accidents combined.[5] More Americans are killed in US hospitals every six months than died in the entire Vietnam War or three “jumbo” jets crashing every two days.[5]

A cross sectional analytical study on the quality of the Australian health care system reviewed 14,179 admissions in 2005 and 16.6% were found to have had adverse events leading to permanent disability (13.7%) and deaths (4.9%); 51% of these adverse events were preventable.[5]

In Nigeria, a recent study conducted at the University College Hospital Ibadan revealed an overall medical error rate of 25.2% and 76% prescription error rate.[6] Prescription errors by departments were as follows: wards 33.6%, General Outpatient Department 24.6%, Medical Outpatient Department 23.4% and Accident and Emergency Department 18.5%. This study also revealed that there was no policy in place for reporting, monitoring, evaluating and preventing medical errors.[6]

The objective of this study is to compare the perceptions of physicians on the occurrence of medical errors and disclosure practices in government secondary and tertiary health facilities in Abuja, Nigeria and to identify the factors associated with the occurrence of medical errors as well as the barriers and motivations to disclosing medical errors among physicians.

Materials and methods

The study was carried out in public hospitals in Abuja Nigeria over a period of eight weeks: six hospitals at the secondary level and two at the tertiary level of the health system. Abuja officially became Nigeria's capital on December 12, 1991. Based on the 2006 census, the population of the FCT was 1,405,201 people. In 2019, its population was estimated to be over 5 million people. All cadres of medical and dental practitioners (i.e. consultants, resident doctors, medical officers and house officers) in the selected government secondary and tertiary health facilities in the Federal Capital Territory (FCT) Abuja were studied. A total of eight focus group discussions were conducted among the various cadres of physicians, four groups each from the tertiary and the secondary health facilities to collect qualitative data for the study. The qualitative method was complemented by quantitative data obtained using an observational checklist that was used to assess previously completed prescription sheets. A total of 420 prescriptions sheets were studied; comparing 210 from the secondary health facilities with 210 from the tertiary health facilities.[7] The prescription sheets were selected using simple random sampling method. Samples were taken from the population of prescription sheets used within the previous one month in the hospital pharmacy departments.

Ethical approval was obtained from the Federal Capital Territory (FCT) health research ethics committee. Also permission was obtained from the relevant hospital authorities and heads of departments, units and teams. Written consent was obtained from all participants for the focus group discussions. The participants were assured of confidentiality of information given. Participation in this study was voluntary and participants were free to withdraw at any stage of the study without any penalty. The researcher(s) maintained a responsibility for honesty and integrity at all stages of the research process and the data collected were used only for this study.

Sample Size Determination

Using Kirwood and Stern's formula, the sample size for comparison of two independent proportions was calculated:[7]

$$n\,per group = \frac{2(Z\alpha + Z\beta)^2\pi(1-\pi)}{d^2}$$

Where,

n = minimum sample size per group
N = total sample size
Zα = standard normal deviate corresponding to the probability of α, i.e., the probability of making a type 1 error at 5% = 1.96 (obtained from the statistical table)
Zβ = standard normal deviate at 90% statistical power, corresponding to the probability of making a type 2 error = 1.28 (obtained from the statistical table)
π = mean of two proportions P_1 and P_2
P_1 = previous estimate of non-disclosure of medical errors among physicians
P2 = previous estimate of non-disclosure of medical errors among physicians
d = the desired level of difference between the two groups.

Studies conducted in the USA and Canada documented 66% prevalence of non-disclosure of medical errors among physicians and this was used in this study to detect a difference of 15% of non-disclosure between physicians at the secondary and tertiary levels of the health system in the FCT Abuja.[7]

Therefore,

$$P_1 = 66\% = 0.66$$
$$P_2 = 81\% = 0.81$$
$$\pi = 66 + \frac{81}{2} = \frac{147}{2} = 73.5\% = 0.735$$
$$1 - \pi = 1 - 0.735 = 0.265$$
$$n = \frac{2(1.96 + 1.28)^2 \times 0.735x0.265}{0.15^2}$$
$$n = \frac{20.9952 \times 0.735 \times 0.265}{0.0225}$$
$$n = 182 = minimum\ sample\ size\ for\ each\ group$$

A non-response rate of 10% was added, i.e. 182 x 100/90 = 202.2 prescription sheets per group. Therefore total sample size = 203 × 2 groups = minimum 406 total sample size; i.e. *N=406*.

Sampling technique

A cluster sampling technique was used in this study. Each health facility was studied as one cluster. Twelve (12) secondary and two (2) tertiary health facilities were identified using available information from the Federal Capital Territory administration. Each health facility was classified as one cluster; therefore two government tertiary health facilities (= 2 clusters) were selected by simple random sampling method out of the three tertiary health facilities and six government secondary health facilities (= 6 clusters) were also selected by balloting out of the 12 health facilities. All eligible, selected and consenting medical and dental practitioners: consultants, resident doctors, medical officers and house officers were studied. Each participant for the FGD was selected using the snow ball technique.

Research instruments

The study involved focus group discussion (FGD) sessions using an FGD guide to obtain qualitative data on the issues and facts of errors as should be applicable in the local Nigerian situation, based on studies of medical errors abroad. In addition, an observational checklist was applied to 420 prescription sheets to collect data on prescription writing errors (Supplementary Material: Appendix 1).

The instruments were administered by the researcher and four trained research assistants. The researcher coordinated and supervised all of the activities. The research assistants underwent a two-day training on the study objectives, the focus group methodology and the use of the checklist.

Both the FGD guide and the checklist were pre-tested among physicians at the General Hospital Suleja in another state (Niger State) to minimize contamination bias and the necessary corrections and modifications were made based on findings.

The observational checklist

The observational checklist (Supplementary Material: Appendix 1) was constructed by the researcher. The checklist was applied to the physicians' prescription sheets, 210 from the secondary and tertiary health facilities respectively. The prescription sheets used were those received in the pharmacy departments in the previous one month and were selected by simple random sampling method.

The focus group guide and discussions

The FGD guide (Supplementary Material: Appendix 2) consisted of six questions aimed at obtaining qualitative data on the predominant perceptions, opinions and insights of the various cadres on medical error occurrences, along with the associated factors, disclosure practices, barriers, and motivations for disclosure of medical errors.

The researcher served as moderator and facilitator of all the discussions. The researcher was assisted by a time keeper, two audio recorders, a note taker, an observer and recorder of non-verbal communications.

The FGD guide was used for all discussion groups; each sessions lasted 45 to 60 minutes. Sessions were held at the health facilities such as a conference room or other convenient settings. Participants were seated in round-table fashion, facing each other. They were asked to speak one at a time, encouraged to keep their focus, maintain momentum, and to seek closure for all questions, and advised that there were no wrong or right answers.

Eight FGD sessions were conducted at both the secondary and tertiary levels of health care. The following cadres of physicians were studied: Consultants, resident doctors, medical officers and house officers. Each group was selected by identifying one eligible and consenting contact physician from each cadre, four from the secondary and four from tertiary health facilities that provided names of other potential participants from their type of health facilities. A group consists of 7-11 members (minimum 6-10) to minimize estimated attrition rate of 10%. Each group included proportionately, males and females of the same professional cadre. Personal contact was made with each potential participant, after which they were sent a follow-up letter of invitation. Each participant was given a telephone reminder 24 hours before the session. During the sessions, the moderating researcher focused on the primary goal of colleting useful information to meet the study objectives. Discussions focused on the answers to each question, one person spoke at a time, with follow-up questions asked where appropriate. A summary of what was heard and observed during and shortly after the interviews was written up by the note taker. The moderator remained attentive to all further contributions and comments at the end of each session and then verified the tape recordings, discussion notes, and observations of non-verbal communications.

Data analysis

Data from the checklist were entered and analyzed using SPSS version 15 software. Results from the secondary and tertiary health facilities were compared as proportions and percentages. Chi square test at significance level of 5% was applied and findings presented in tables. In most cases the exact p-values were reported.

Data from the FGD was analyzed for each group as follows: Verbatim transcripts were produced and these were compared with the hand-written notes: a descriptive account. Data cleaning, sorting and systematic coding using content analysis was done manually. Content analysis by identification of themes, incidence density, assigning of working definitions to codes was also done. New codes were developed as required and code saturation was noted as well as dropping of codes rarely used. Sought after themes and emergent themes were noted: an interpretative account. Finally, summarization including the grouping of same coded themes into categories and then report writing were done.

Results

Quantitative results

The secondary level had greater prescription writing error rates than the tertiary level: for example, omission of patients' age (75.2% > 33.3%; $p = 0.001$); omission of patients' address (88.1% > 3.3 %; $p = 0.001$) and omission of hospital identification numbers (31.4% > 2.3%; $p = 0.001$) as shown in Table 1.

Table 1. Prescription writing errors among physicians

Checklist Items	Tertiary Level (n=210) n (%)	Secondary Level (n=210) n (%)	χ^2	p
Patient's name not indicated	6 (2.8)	7(3.3)	2.63	0.15
Patient's age not indicated	70 (33.3)	158 (75.2)	10.55	0.001*
Patient's sex not indicated	5 (2.3)	16 (7.6)	16.60	0.001*
Patient's Hospital number not indicated	5 (2.3)	66 (31.4)	10.15	0.001*
Dose of each drug prescribed not indicated	6 (2.8)	7 (3.3)	0.213	0.70
Route of administration of each drug prescribed not indicated	7 (3.3)	8 (3.8)	5.21	0.04*
All drug formulations not indicated	6 (2.8)	11 (5.2)	14.73	0.001*
Signature or identification mark of the doctor not indicated	7 (3.3)	8 (3.3)	0.72	1.00
Date of prescription not indicated	6 (2.8)	8 (3.8)	0.51	0.10
Patient's address not indicated	7 (3.3)	185 (88.1)	11.98	0.001*
*Statistically significant				

Qualitative results

The house officers at the tertiary level were in agreement that medical errors were occurring daily; however some of these errors were not very serious and the patients were often unaware of errors:

"I think medical errors occur daily but not on the high side,'' a female house officer said.

The house officers from the secondary health facilities gave similar responses. The following was what one of them said:

"Even though I have worked as a medical doctor for only eight months now, I have seen medical errors occur almost every day."

The medical officers at the tertiary level responded in the affirmative that medical errors occur "sometimes" in their practice no matter how long their experiences in medical practice might be.

"Medical errors often have no respect for persons because to err is human," said a female senior medical officer.

The medical officers at the secondary level were largely of the opinion that medical errors occur very often in their practices.

"I think medical errors occur on a daily basis; but many of them are minor errors," said one of the doctors. The factors associated with the occurrence of medical errors identified pertain to the worker, the work environment and the medical equipment as summarized in Table 2.

Table 2. Factors associated with the occurrence of medical errors identified from the FGDs.

Focus Group Discussion Sessions	Tertiary Level	Secondary Level
Consultants	✓ Lack of medical equipment ✓ Poor working conditions ✓ Poor training and supervision	✓ Obsolete or faulty equipment ✓ Poor working environment ✓ Overwork
Resident doctors	✓ Poor working conditions ✓ Lack of training and re-training ✓ Poor documentation of patients' records	✓ Overwork, stress and fatigue ✓ Poor working conditions e.g. irregular power supply
Medical officers	✓ Poor communication with colleagues and patients ✓ Poor interpersonal and inter-professional relationships	✓ Poor attitude to work ✓ Intrusive nature of modern medical practice
House officers	✓ Overwork and stress ✓ Poor training ✓ Inability to recognize competence limits	✓ Inadequate rest and fatigue ✓ Shortage of doctors

The house officers' common practice was that they were not disclosing medical errors to their health institutions. Minor errors were however being disclosed to patients when the patient was the understanding type:

"Report officially? I say, no! Reporting to the health institution? I have never done that," according to one male house officer.

"I think it is better not to even tell the patient at all except in cases of surgical errors, where the error is very obvious and therefore necessary to discuss," according to a female house officer.

The house officers at the secondary level were found to be more disposed to medical errors disclosure to their senior colleagues in the context of their own work place setting. However, they were still reluctant to disclose medical errors to patients. According to a female house officer:

"When I make a mistake, I disclose to the medical officer who then puts me through. One day, I asked the matron in charge of our labour room; she is like a mother to me."

Most of the barriers to disclosure identified relate largely to the physicians' reputation, protection and interest rather than that of the patients as outlined in Table 3.

Table 3. Barriers to disclosing medical errors identified from the focus group discussions

Focus Group Discussion Sessions	Tertiary Level	Secondary Level
Consultants	✓ Fear of negative media reports ✓ Fear of negative societal reactions	✓ Lack of malpractice insurance ✓ Fear of negative patient reactions ✓ Fear of damage to professional reputation
Resident doctors	✓ Lack of disclosure policy ✓ Fear of negative patient reactions ✓ Fear of damage to career	✓ Fear of lawsuits ✓ Fear of job loss
Medical officers	✓ Possible loss of professional license ✓ Probable loss of self-respect ✓ Unhealthy competition in the training	✓ Likely loss of professional license ✓ Blame from colleagues and the institution
House officers	✓ Possible loss of professional license ✓ Competition in medical training	✓ Lack of the required skill to report

The common motivations to disclosure were the support and understanding of the management of the health institutions and professional colleagues as summarized in Table 4 below.

Table 4. Motivations to medical error disclosures identified from the focus group discussions

Focus Group Discussion Sessions	Tertiary Level	Secondary Level
Consultants	✓ Receiving a positive feedback from the institution	✓ An assurance that there will be no punitive measures ✓ Receiving the support and understanding of colleagues
Resident doctors	✓ If disclosure will be an opportunity to learn from the mistake	✓ If positive responses will be received from colleagues ✓ If prevention of errors is the reason for the disclosure
Medical officers	✓ If there is a good interpersonal relationship	✓ If disclosure policy and malpractice insurance are made available
House officers	✓ If disclosure will strengthen my patient's trust in me as a physician	✓ If patient is God fearing

Discussion

This study revealed that prescription writing errors occurrence rates at both the tertiary and secondary levels were very high. This is in accord with findings from the FGDs where all the groups of physicians acknowledged the fact that medical errors occur 'almost daily' or 'daily' in medical practice. Our findings of the high rates of occurrence of errors do not compare favorably with findings in the United States of America where only 20% to 42% of patients reported personal experience with an error in their healthcare or in Germany where only 30% of patients reported errors in their personal health care. However, despite the lower error rates in the USA, annual deaths due to medical errors in the USA was reported to be high and this was ranked the fifth leading cause of death ahead of deaths due to all forms of accidents combined.[8,9]

Other studies on medical errors from African countries such as South Africa, Ghana, Sudan, and Nigeria, suggest that overall medical error occurrence rates in Africa were mostly very high.[10, 11, 12, 13] For example a clinico-pathologic study on missed fatal firearm wounds in 2010, by Bhana and colleagues, in Durban, South Africa; reported error rates ranging from (49.3% to 63.9%). Another study by Clarke and colleagues in Kwa-Zulu Natal province in South Africa; among surgical patients reported a high overall mortality rate of 27.0%, attributed directly or indirectly to medical errors.[14] These high medical error occurrence rates are very similar our findings.

A descriptive study to evaluate the level of completion of haematology request forms at a Ghanaian tertiary hospital by Olayemi and colleagues; revealed overall error rates of 22.7% to 96%. Even though this was a wide range, it does suggest that the error rates in Ghana are very high. In addition, a cross sectional study by Yousif and colleagues; aimed at analyzing the appropriateness of prescription writing in different health facilities in Wad Medani, Sudan; revealed prescription error rates of 6.9% to 99.9%. Our study also showed high prescription error rates of 2.3% to 88.1%.

The FGD sessions revealed associated factors such as poor working environment, overwork, fatigue, stress and other factors related to the worker. Similar factors have been reported by Clinton and colleagues in the United States of America.[15] In addition, this study revealed that the secondary level of the health facility is more frequently associated with the occurrence of medical errors.

In a study in the US by Philips and colleagues, most deaths associated with medical errors involved central nervous system drugs, cardiovascular system drugs or anti-neoplastic drugs. According to that study the deaths involved mainly wrong drug dose and wrong drug routes errors.[16] Our prescription writing checklist however revealed an overall wrong drug route error rate of only 3.8% which is less than the error rate of 9.5% reported by Philips and colleagues but this may be due to the different settings. Reason and colleagues, also reported similar conditions that often predicate errors, for example error-producing conditions.[17] Error-producing conditions according to Reason and colleagues include individual, team and environmental factors in relation to the assigned task that often affect performance such as momentary distractions and interruptions in the process of carrying out the tasks.[17] In slight contrast, Abdoul-Fatouh and colleagues in Cairo Egypt, reported lack of team work as an important factor in the occurrence of medical errors.[18]

This study revealed that medical error disclosure practices among physicians at both levels were poor. Lack of malpractice insurance for doctors, lack of policies for reporting medical errors, and negative patient reaction as well as lack of the required skill for disclosure are the major barriers to disclosure revealed by our study. This is in contrast to findings from a similar study in the USA by Jericho and colleagues, where the major concerns of physicians were possible damages to doctor-patient relationships and possible legal consequences.[19] There were however some concerns about medical litigations from our respondents as implied by negative patient reactions which may lead to medical litigations. These differences in barriers may also be attributed to the different settings and environments in which the physicians live and work.

On the motivation to disclosures, our study revealed that physicians would be motivated to disclose errors if they would receive positive feedback from the institution as well as the support and understanding of colleagues. Kaldjian and other studies reported similar findings.[20,21,22] Also studies suggest that physicians would be motivated if reporting will help their colleagues to learn from their mistakes and if disclosure will help alleviate their feelings of guilt or strengthen patient's trust in them. [20,23,24,25] Motivations to disclosure may be expected to vary from one country to another and this probably accounts for the observed differences.

Conclusion

The perceptions of physicians suggest a high medical errors occurrence rates and poor disclosure practices. The required non-punitive institutional policies or professional guidelines and laws should therefore be put in place to enable medical doctors carry out their ethical and lawful duties to their patients without any fear of disclosing medical errors. Also there is a need for institutionally administered malpractice insurance for medical doctors.

List of Abbreviations

(1) FMCPH: Fellow Medical College of Public Health
(2) MBBS: Bachelor of Medicine and Bachelor of Surgery
(3) DOH & S: Diploma in Occupational Health and Safety
(4) MPH: Master's Degree in Public Health
(5) MSc: Master of Science
(6) SPSS: Statistical Package for Social Sciences

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Conflict of interest

There is no potential conflict of interest on this study.

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Supplementary Material

Appendix 1-The observational checklist on prescription writing errors

		Yes	No
a.	Date indicated?		
b.	Patient's name indicated?		
c.	Patient's age indicated?		
d.	Patient's sex indicated?		
e.	Patient's address indicated?		
f.	Hospital or identification number of patient indicated?		
g.	Dose of each drug prescribed indicated?		
h.	Route of administration of each drug prescribed indicated?		
i.	Drug formulation indicated?		
j.	Signature or name or identification of the doctor indicated?		

Supplementary Material: Appendix 2–Focus Group Discussion (FGD) Guide

The questions and follow-up questions for the FGD were as follows:

Introductory/engagement question

1. In your opinion, what are medical errors including medication errors and prescription errors? What are the types of medical errors?

Exploratory questions

2. Can you discuss your experience with the occurrence of medical errors in your practice? What factors are associated with the occurrence of medical errors? Do you have any actual error disclosure experience in your practice? Could you please tell us more?

Key questions

3. Whose professional duty is it to disclose medical errors to professional colleagues, your health institution and or the patients?
4. To what extent would you disclose your medical errors to your patient or support a policy of open disclosure to patients in your health facility?
5. What is your opinion about patients, who change their physician under whom they suffered medical injury as a result of non-disclosure?
6. What major barriers (s) and motivation (s) do you think affect the disclosure of medical errors in your practice?

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