Open Science

Common Medical Errors and Error Reporting Systems in Selected Hospitals of Central Uganda

Katongole Simon Peter[1, *], Robert Anguyo DDM Onzima[2], Miisa Nanyingi[1], Nakiwala Stella Regina[3]

[1]Faculty of Health Sciences, Uganda Martyrs University, Kampala, Uganda

[2]Department of International Public Health, Liverpool School of Tropical Medicine, Kampala, Uganda

[3]HealthPartners Uganda, Bushenyi, Uganda

Email address

skatongole@umu.ac.ug (K. S. Peter), ranguyo@yahoo.com (R. A. D. Onzima), mnanyingi@umu.ac.ug (M. Nanyingi), rnakiwala@gmail.com (N. S. Regina)

Abstract

Medical errors are under studied in the developing world, therefore, this study set out to identify common errors committed during provision of health care and error management systems in the hospitals with reference to central Uganda. This was a descriptive cross sectional study carried out between January 16th and January 22nd 2012 in four hospitals in central Uganda (2 Public hospitals and 2 Catholic Private not for profit hospitals). A total of 160 health workers participated in the study. Respondents were interviewed the on errors they had committed or witnessed happening in their hospitals during the 3 months preceding this study. Patients' records of the three months preceding the study were also reviewed to identify the common medical errors that had been committed. Of the six hundred and eighteen records that were reviewed' medication (17.2%) and diagnostic (40.5%) were the commonest medical errors. Health workers too mentioned medication (58%) and diagnostic (53%) as the commonest errors they had witnessed or committed in the hospitals. No formal error reporting system existed in all the hospitals. Errors committed or witnessed were mainly disclosed to supervisors and/or colleagues during handover of duty and informal interactions. Lack of feedback, fear of punishment and litigation were the major impediments to disclosing errors. Error reporting importance was highly perceived by health workers. Instituting a mechanism of formal error reporting and management should be considered by the hospitals and the ministry of health so that errors can be used as a mechanism for 'prevention by past experience'.

1. Introduction

Despite advances in medicine and healthcare, hospitals have remained places where patients are getting harmed [1]. In a bid to save patients, healthcare workers need to be fast and sometimes provide healthcare under pressure. Healthcare is also delivered by different people, each making different decisions hence errors and mistakes may occur, causing injuries to the patients [2].

Patient safety has increasingly become an essential discipline complete with an integrated body of knowledge and expertise to improve health care [3]. One component of patient safety is reporting of errors by the healthcare providers within the hospital or healthcare organization and by the organization to a broader audience through a system-wide, regional, or national reporting system [4]. Error reporting involves detecting, recording, communicating, analyzing incidents or events occurring to patients during the process of healthcare administration with feedback and dissemination of lessons learned from the reported events [5].

An effective error-reporting system is the cornerstone of safe practice and a measure of progress towards achieving a safety culture within a healthcare organization. The practice of error reporting originated from high-reliability organizations [6]. Such organizations include the aviation, atomic and marine industries. These (high-reliability) organizations perform at peak intensity in highly risky environments with fewer incidents of errors and mistakes. Lessons from high-risk organizations are that committed

errors are reported and measures are put to safeguard against such mistakes from happening. They also have standard operating procedures that guide the operation of different processes within the organization.

Patient safety is moving up the list of priorities for hospitals and healthcare delivery systems. However, improving safety across a large organization is challenging [7]. Most of the current evidence on errors comes from hospitals. Since the risks associated with hospital care are high, strategies for improvement are better documented and this calls for trust from the patient. Many errors occur in other healthcare settings such as physicians' offices, nursing homes, pharmacies and patients' homes. Recent literature highlights concerns about outpatients as well, though there are few data on the extent of the problem outside hospitals [8].

The Institute of Medicine in the United States of America report that in 1999 'the deaths of up to 100, 000 patients per year may be due to preventable adverse events and errors'[1]. This report appealed for healthcare organizations to create voluntary reporting systems to improve the understanding of factors that contribute to medical errors.

The situation (of medical errors and adverse events) in developing countries merits particular attention. The probability of an adverse event or error occurring is much higher in developing countries because of the poor infrastructure and equipment; unreliable supplies; and poor quality of drugs [9]. Other shortcomings related to adverse events or errors in developing countries' healthcare include; poor waste management, inadequate infection control and poor performance of personnel because of insufficient technical skills and severe under financing of health services [10]. This inadequacy of resources may force health workers to improvise thus increasing the risk of medical errors.

Uganda's, health system is served by 'data-poor hospitals'. The hospitals do not collect data on patient characteristics, processes of care and the data sources are neither accessible nor reliable [11]. Little is known from Ugandan hospitals about the practice of error reporting, despite the fact that Uganda is a signatory to the WHO Alliance on patient safety [3]. In Uganda, reports are only written for maternal death audits, pharmacovigelence for adverse drug reactions but there are no other known reports for errors, near misses or other adverse events. This implies that millions of patients receiving healthcare from Ugandan hospitals may be at risk of unsafe incidents.

The Health Management Information System (HMIS) which the Uganda health system relies on for data does not capture errors and adverse events. The few initiatives for reducing the incidence of adverse events like maternal death audits have not been expanded to all levels of healthcare delivery in Uganda's health system. Inadequate reporting of errors and adverse events compromises patient safety because health workers do not learn from the errors and adverse events that occur but patients continue to suffer harm from the errors and adverse events in the hospitals [11]. The combination of the above factors leads to increased hospital costs to the patients due to the prolonged stay and management of the errors. Similarly to the hospitals and health workers, it increases the cost of providing services, loss of trust in the services being provided, heavy workload and may lead to litigation.

This study aimed to gain a deeper understanding of the common medical errors and available error reporting mechanisms hence the patient safety commitment and error-reporting culture in the Ugandan hospitals. During the study, we focused on medical errors witnessed or committed by health workers the year preceding this study, how they reported the errors seen or committed and factors that affected error reporting or disclosure.

The study framework on error reporting was developed with the main assumption that staff would be discouraged from reporting errors because of the absence of a reporting culture within the hospitals. Other factors that would influence error reporting in the hospitals are; regulation policies, procedures and protocols on reporting errors. The leadership of the hospitals, communication systems within the hospitals and knowledge, attitudes and beliefs on common errors and disclosure by health workers also influence the reporting systems. Reporting of errors committed in the hospitals leads to learning from the mistakes committed so that the hospital can put mechanisms of reducing and preventing mistakes leading to improved patient safety.

2. Methods

2.1. Study Setting, Design and Sampling

A descriptive cross-sectional study was conducted between January 16th and January 22nd 2012 in 4 hospitals (2 government and 2 faith based private not for profit, PNFP) in central Uganda, approximately 200 km south of Kampala. During the study, both quantitative and qualitative data was collected and analyzed.

The hospitals were selected because they offer first-specialized services to the patients such as surgical and gynecological operations as well as in-patient care. Two of the hospitals (Rakai and Villa Maria) are district (general) while the other two (Kitovu and Masaka) are regional referral hospitals. Kitovu and Villa Maria hospitals are Private Not for Profit (PNFP) hospitals owned by the Catholic diocese of Masaka whereas Masaka and Rakai hospitals are Government-owned hospitals. Hospitals of different types were chosen since they have different working conditions and different working environments and these provide differential contexts for committing and responding to medical errors. The respondents consisted of health workers in the cadres of medical officers, nurses and allied health professionals and we purposively chose them (the cadres) because of either their daily interaction with patients or position in management hierarchy. Due to the nature of shifts of work and time available, we recruited all eligible workers on duty during the study week. In each hospital, medical

superintendents, senior nursing officers, ward in-charges, hospital administrators and heads of human resource department served as key informants.

2.2. Data Collection

The most recent inpatient records were reviewed (from September to December 2011 for Villa Maria, Masaka and Rakai hospitals; and November and December for Kitovu hospital) of paediatric and maternity wards to obtain errors that had been committed. We carried out interviews with key informants on prevalent practices on error reporting and factors that motivate or de-motivate health workers to report errors.

Medical errors associated with the healthcare process were grouped into five criteria that included; medication errors, prescription errors, surgical errors, diagnostic errors, investigative errors and preventive errors. Health workers were required to mention errors they had witnessed or had committed in their practice. Likewise, in-patient records were reviewed to identify errors that had been committed.

We described medical error as any omission or commission of a mistake related to the process of administering medicine. Such errors included; wrong dose, a dose that is more than the conventionally accepted dose according to the Uganda Clinical Guidelines (2010) or contemporary pharmacology book (British National Formular- BNF). Poly pharmacy in the study meant many medicines with the same therapeutic effects being prescribed at the same time for a disease condition. Wrong time was a medication given at a time not supposed to be given whereas wrong route meant a medicine being given via a route not ordered by the clinician or a clinician ordering a drug to be given via a route it is not mean for in the condition. Wrong patient was a scenario where a patient who is given medicine intended for another patient.

Other medication errors included omitted treatment where a medicine was supposed to be prescribed but it was missed; and illegible prescriptions.

Surgical errors were described as any mistake of omission or commission before, during and after any surgical procedure. Such mistakes included: no consent (where there was no written acceptance for surgery by the patient or his/her next of kin), omitted pre- operative investigation (not performing the necessary investigations before operation) – for example omitting blood grouping and cross-matching. Wrong-site-surgery meant operating on a different site other than the affected or planned one, for example amputating the wrong/normal limb. Forgotten material in patients' body implied forgotten gauze, instrument or other material in the patient's body. Omitting postoperative care was taken as not writing appropriate notes after operation or bypassing post-operative instructions. Diagnostic errors were described as mistakes, omissions or commissions in the process of making a diagnosis. Such errors included; wrong diagnosis such as final diagnosis on patient records but not in line with the history, examination and investigations made. Omitted diagnosis was a diagnosis not made yet history taken;

examination and investigations findings read from the patient records were suggestive of such a diagnosis. Delayed diagnosis was considered as a diagnosis written on the patient records a day after admission when treatment had already been commenced. Other diagnostic errors looked out for included wrong investigations – investigations ordered for but not backed by the history taken and/or findings of physical examination. Omitting investigations meant that the history taken and examinations' findings would have required ordering a particular test but was never ordered for or carried out. Failure to use results was considered as investigation results pointing to a particular diagnosis or finding but such a diagnosis not being made as per the patient records.

In assessing the practice of error reporting in the hospital, we sought health workers' responses to what happened when error was committed or witnessed, whether error was reported, nature of reporting if it happened and feedback mechanism in case error was reported.

Error reporting is affected by factors such as knowledge of health workers on error reporting, attitudes of health workers on error reporting, practices of health workers on error reporting. All these could be barriers against error reporting. These were investigated. The existence of factors that would motivate health workers to report errors such as existence of rewards or incentives to those who report, absence of punishment to those who report, knowledge of the outcome of the error, feedback mechanisms available and presence of a body responsible for error reporting were sought for.

2.3. Data Analysis

We analyzed quantitative data using the Statistical Package for Social Scientists (SPSS) software (version 16.0) and Microsoft office excel using mainly frequencies. We presented the quantitative results in tables. Qualitative data were analyzed thematically by identifying and tallying responses with similar themes and presented in narrative.

2.4. Ethical Consideration

Ethical review of the proposal was carried out and approved by the board of faculty of health sciences of Uganda Martyrs University. Permission to carry out this research in all hospitals was sought from the medical superintendents of each hospital. We sought written consent from each respondent before the interview and after having explained the objectives and aim of the study to each respondent. For anonymity, we coded the hospitals as 1,2,3,4.

2.5. Limitations

The key limitation of this study was (our) failure to achieve the required sample size in all the hospitals due to the weekly change of duties in the hospitals. Similarly, many records were incomplete and were not worthy reviewing. Some errors could have been better captured by direct observation of the healthcare giving process but this was impossible.

3. Results

A total of 160 health workers who included 21 medical officers, 116 nurses, 21 midwives, 8 clinical officers, 5 dispensers and 10 other allied health professionals participated in the study (table 1). All the medical superintendents (4), hospital administrators (4) and senior nursing officers (4) in the hospitals were interviewed. Three ward in-charges, 2 in-charges of the HIV/AIDS departments and 2 heads of human resource department were also interviewed.

***Table 1.** Hospitals studied and respondents.*

Hospital	District	Ownership	Medical officers	Nurses	Midwives	Clinical officers	Dispensers	Other	Total
1	Kalungu	PNFP	-	22	4	3	1	-	30
2	Masaka	GOVT	10	41	7	3	-	-	61
3	Rakai	GOVT	4	17	4	1	1	-	27
4	Masaka	PNFP	7	36	6	1	2	5	57
Total			21	116	21	8	4	5	175

3.1. Medical Errors Witnessed by Health Workers in the Hospital

The commonest type of error witnessed by health workers during their work was medication error and diagnostic error observed by 58% and 53% of the health workers respectively (Table 2).

3.2. Types of Errors Identified by Review of Records

Results of the review of inpatients' records revealed that diagnostic (40.5%) and medication (17.2%) errors were the most committed errors.

***Table 2.** Errors witnessed by respondents and reviewed from the records.*

Hospital	Type or error respondents witnessed					Types of errors identified by review of records (%)				
	No. respondents (n)	Medication	Surgical	Preventive	Diagnostic	records reviewed	Medication	Surgical	Preventive	Diagnostic
1	37	70.0%	54.0 %	24.0%	76.0 %	510	9.0%	0.8%	3.3%	7.3%
2	61	37%	27.0%	6.6%	27.0%	892	2.6%	10.0%	2.5%	31.8%
3	27	88.9%	74.1%	22.2%	77.8%	516	29.3%	4.5%	0.8%	40.3%
4	57	36.0%	14.0%	19.0 %	31.0%	554	28.0%	20.0%	10.0%	42.0%
Average	182	58.0%	42.0%	18.0%	53.0%	618	17.2%	8.8%	4.2%	40.5%

3.3. Nature of the Medical Errors in the Hospitals

We set out to identify the nature of medical errors as witnessed by the respondents and reviewed from the hospitals' records on the paediatric and maternity wards. This involved identifying the form of how each of the major classification of medical errors was witnessed by health workers or the form in which the errors were reviewed in the patients' records.

In all the hospitals, poly pharmacy, wrong-dosage, and administering medicines at wrong times were the most-witnessed medication errors. Other errors mentioned included missing to give treatment, unnecessary drugs being given, inappropriate transfusion and poor monitoring of drugs given to the patient. The commonest surgical errors mentioned by the staff in all the four hospitals were poor pre-operative management and missing pre -operative laboratory investigations. Health workers mentioned delayed diagnosis and inappropriate investigation as the commonest diagnostic errors witnessed.

3.4. Nature of Medical Errors Identified by Review of Records

We reviewed records to identify the nature of the different types of medical errors that had been committed and results (Table 3). Commonest medication errors identified were wrong-dosage and poly pharmacy in three of the hospitals whereas in hospital 1, giving a drug at a wrong time was the commonest medication error. For surgical errors, inappropriate pre-operative management, omitting pre-operative investigations and omitting post-operative notes were the commonest in all the hospitals. Making wrong diagnosis, delayed diagnosis and omitting diagnosis were the commonest diagnostic errors identified when records were reviewed in all the hospitals.

3.5. Error Management in the Hospitals

With regard to the practice of error management, we asked health workers as to whether they reported the errors they had witnessed (or not). We also asked key informants as to how they got information about the errors in the hospital.

Findings from health workers indicated that generally, errors committed were disclosed verbally immediately when they happened, mainly to in - charge ward officers and to fellow staff. This disclosure typically occurred during shift changes. Errors were also disclosed later in ward meetings. Contrary to the views of the health workers, key informants revealed that errors committed were detected mainly through reviewing treatment forms, through supervision and inspection of findings on wards and sometimes through rumors which are later investigated. On the other hand, patients reported what they perceived to be errors directly to the hospital administration.

It was also noted by one of the key informants that health workers did not report errors perceived as serious and could affect them but were motivated to report when they anticipated that they would directly benefit from such reports.

Human beings are very difficult. Those who commit big mistakes will never disclose them yet those who report mistakes committed by their colleagues; do so with either biased feelings or with hope to directly gain from such a report [key informant, hospital 1].

3.6. Factors Affecting Error Reporting in the Hospitals

We grouped factors (investigated from the health workers)that would affect reporting of medical errors into: attitude of health workers on error reporting; and knowledge of importance of error reporting to a patient, to the health worker and to the hospital. We assumed that a health worker with good attitude on error reporting and if knowledgeable about error reporting would easily report errors. In all hospitals, majority of the health workers (97%, 93%, 89% and 88% in hospitals 1, 2, 3 and 4 respectively) were willing to report medical errors.

As regards to knowing the importance of error reporting to the patients, in hospitals 1,2,and 3, health workers believed helping patients to receive quality healthcare as the most important benefit of error reporting to the patients. While, in hospital 4, the most important benefit of error reporting to the patients reported by health workers was improving patient safety. For importance of error reporting to the health workers, in hospitals 1 and 2, health workers reported that offering good quality of services was the most important benefit of error reporting to health workers. In hospitals 3 and 4, respondents reported avoiding recurrence of the errors as the most important benefit of error reporting to the heath workers. Regarding importance of error reporting to the hospitals, in two of the hospitals, giving a good image to the hospital was mentioned while in the two hospitals, helping offering quality service was the most important benefit of error reporting to the hospital.

Table 3. *Medical errors identified by review of records.*

Type of error	Hospital			
	1	2	3	4
Medication	**n=46**	**n= 23**	**n= 203**	**n= 155**
Wrong time of drug administration	21(45.6%)	0 (0.0%)	3 (1.5%)	12 (8.0%)
Omitted treatment	0 (0.0%)	0 (0.0%)	0 (0.0%)	42 (27.0%)
Wrong dose	14 (30.5%)	0 (0.0%)	35 (17.2%)	71 (46%)
Poly pharmacy	5 (10.8%)	14 (60.9%)	32 (15.8%)	17 (11.0)
Wrong patient	0 (0.0%	0 (0.0%)	1 (0.5%)	2 (1.0%)
Wrong route	0 (0.0%)	1 (4.3%)	47 (23.2%)	3 (2.0%)
Wrong drug	0 (0.0%)	0 (0.0%)	60 (29.6%)	0 (0.0%)
Others	6 (13.0%)	8 (34.8%)	25 (12.2%)	0 (0.0%)
Surgical errors	n=17	n= 22	n= 23	n=144
Inappropriate Pre-operative mgt	0 (0.0%)	5 (22.7%)	16 (69.6%)	64 (44.4%)
Omitted pre-operative investigation	2 (11.3%)	14 (63.6%)	2 (8.7)	37 (26.1%)
Forgotten materials in pts body	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (2.1%)
Wrong site surgery	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Omitting post operative notes	9 (53.0%)	1 (4.5%)	0 (0.0%)	10 (6.9%)
Others	6 (35.3%)	2 (9.1%)	5 (21.7%)	30 (20.8%)
Preventive errors	n=3	n= 2	n=5	0
Failure to provide post operative treatment	3 (100.0%)	2 (100%)	2 (0.4%)	0 (0.0%)
Diagnostic errors	n=37	n= 89	n= 208	n=232
Delayed diagnosis	8 (21.6%)	7(7.9%)	2 (1%)	131 (56.5%)
Inappropriate investigation	5 (13.5%)	2.2	26 (12.6%)	0 (0.0%)
Wrong diagnosis	9 (24.3%)	7(7.9%)	9 (4.1%)	22 (9.4%)
Omitted diagnosis	6 (16.2%)	70 (78.7%)	33 (15.7%)	51 (22%)
Failure to use results	2 (5.4%)	0 (0.0%)	3 (1.6%)	3 (1.3)
Inadequate history and examination	6 (16.2 %)	0 (0.0%)	11 (5.1%)	10 (4.3%)
Others	1 (2.7%)	3.4	7 (3.3%)	15 (6.5%)

Table 4. Importance of medical error reporting to the hospital, to health workers and to patients.

Response	Hospital			
	1 (n=37)	2 (n=61)	3 (n= 27)	4(n=57)
Importance of error reporting to the patients	**f (%)**	**f (%)**	**f (%)**	**f (%)**
1.Helps patients receive quality treatment	20 (54.1%)	30 (49.2%)	21 (77.8%)	0 (0.0%)
2.Helps prevent health hazards	17 (45.9%)	0 (0.0%)	19 (70.4%)	0 (0.0%)
3.Fastens healing hence reduced hospitalization	17 (45.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
4.Helps to save patients life	15 (40.5%)	4 (6.6%)	10 (37.0%)	0 (0.0%)
5. Helps to correct the error	13 (35.1%)	19 (31.1%)	0 (0.0%)	0 (0.0%)
6.Helps reduce medical bills	11 (29.7%)	0 (0.0%)	0 (0.0%)	8 (14.0%)
7.Improves patient safety	11 (29.7%)	4 (6.6%)	8 (29.6%)	46 (80.7%)
8.Avoid medical legal implications	0 (0.0%)	2 (3.3%)	5 (18.5%)	0 (0.0%)
Importance of error reporting to health worker				
1.Offer good quality services	19(51.4%)	0 (0.0%)	8 (30%)	15 (26.3%)
2.Confidence building	18 (48.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
3.Proper patient management	16 (43.2%)	0 (0.0%)	9 (33.3%)	0 (0.0%)
4.Avoid re- occurrence	15 (40.5%)	27 (44.3%)	0 (0.0%)	23 (40.4%)
5.Life saving	13 (35.10%	0 (0.0%)	13 (48.1%)	0 (0.0%)
6.Improves communication	11 (29.7%)	0 (0.0%)	0 (0.0%)	8 (14.0%)
7.Reduced work over load	11 (29.%7)	0 (0.0%)	0 (0.0%)	0 (0.0%)
8.Improves patient satisfaction	0 (0.0%)	0 (0.0%)	3 (11.1%)	0 (0.0%)
9.Avoid litigation	0 (0.0%)	10 (16.4%)	0 (0.0%)	10 (17.5%)
10. Self satisfaction	0 (0.0%)	17 (27.9%)	0 (0.0%)	0 (0.0%)
Importanceof error reporting to the hospital				
1.Good image for the hospital	23 (62.20%)	12 (19.7%)	14 (51.9%)	19 (33.3%)
2.Quality service	20 (54.10%)	17 (27.9%)	22 (81.5%)	2 (3.5%)
3.Safe drug dispensation by the hospital	14 (37.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
4.Cost effectiveness	12 (32.4%)	14 (23.0%)	0 (0.0%)	0 (0.0%)
5.Security purposes	12 (32.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
6.Avoid future errors	12 (32.4%)	0 (0.0%)	1 (3.7%)	3 (5.3%)
7.Good record keeping	11 (29.7%)	1 (1.6%)	0 (0.0%)	2 (3.5%)
8.Reduced mortality	11 (29.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
9.Improved communication	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
10. Avoid litigation	0 (0.0%)	11 (18.0%)	2 (7.4%)	6 (10.5%)
11. Planning purposes	0 (0.0%)	0 (0.0%)	12 (44.4%)	18 (31.6%)

3.7. Challenges of Error Reporting in the Hospitals

We inquired about the challenges faced in the hospitals in error reporting. Managers reported fear of bad image of the hospital before the public when they report these errors as a hindrance to error reporting.

On the attitude of health workers on error reporting, managers reported that some staffs do not want to report errors because they think they cannot make errors. Common in all hospitals was the fear of punishment by the supervisors/employers and fear of termination of their contracts/jobs. It was also mentioned that health workers do not report to avoid embarrassment from colleagues and clients as well as fear of litigation. This was reported by one of the managers that;

In Uganda, reporting mistakes is a new thing and there are no legislations to protect us. You can imagine what would happen if such information was used against either the concerned staff or the hospital. It would be worse if such reports were documented [key informant, hospital 4].

3.8. Suggestions to Improve Error Reporting in the Hospitals

Health workers frequently mentioned establishment of a formal error reporting system in the hospital. They further reported that workers should keep consulting each other frequently as measures that can improve error reporting in the hospital.

Key informants expressed need and willingness to establish and support an error reporting system. They suggested that a good error reporting system would provide counseling services to the affected health workers strengthen support supervision and use meetings at various levels to discuss errors.

It is necessary for us to encourage our staff to report errors and we are expecting your findings to guide us in establishing protocols for reporting mistakes in this hospital [key informant hospital 3].

Key informants also reported lack of team work, high levels of staff turnover, poor attitude of some health workers and poor communication skills at various levels. One of the key informants reported that;

'We all learn from mistakes... we have tried to build capacity but due to high rate of staff turnover, we have lost most of our skilled health workers' [key informant hospital 4].

4. Discussion

The commonest medical errors identified by the health workers were diagnostic errors and medication errors.

Similarly, reviewing records showed that medication errors and diagnostic errors were the commonest medical errors committed in our study hospitals. This is in agreement with the Institute of Medicine's report released in 2006 which places medication errors as the commonest medical errors [4]. Similarly Sandars in 2005identifies diagnostic errors and treatment errors as the commonest with ranges of appearance between 26-78% and 11-42% respectively [12]. All categories of diagnostic errors we set out to investigate appeared in almost equal measure. These included: wrong diagnosis, omitting to write a diagnosis (that is a clinician not writing a diagnosis on a treatment note but going on to prescribe treatment). Failing to write a diagnosis on a treatment note may make it hard for those administering treatment to properly understand what is being treated and what should be monitored. This may lead to poor drug administration, poor monitoring of patients and inadequate review of patients' conditions all leading to poor treatment outcome.

Making wrong diagnosis further predisposes to wrong prescription. With the already high burden of wrong medicines administered to patients, error in diagnosis not only worsens this situation but also synergizes it. Consequently, there is delayed time on hospital care, rising healthcare cost and poor treatment outcome. Addressing errors of diagnosis should be critically looked at by all actors in different levels of healthcare delivery: in-patient and outpatient alike, since diagnosis is the gateway to responding to ill health, treatment outcome and in the long run, health status. Clinicians' 'not taking enough' history and not doing adequate examination on the patient has an implication that the diagnosis the clinician comes up with may not be the right one hence the client receives improper treatment. This may also result into wrong diagnosis thus patients receiving treatment they are not meant to have.

Poly pharmacy and giving wrong dose of medicine to patients were the commonest medication errors witnessed by health workers in the hospitals. Giving wrong dose and wrong drug to a patient were the commonest medication errors identified when records were reviewed. The findings are in agreement with those of Kauffman in a study published in 2006that identifies common errors such as doctors writing prescriptions that could interact dangerously with other drugs a patient is taking, nurses putting the wrong medication or the wrong dose in an intravenous drip and pharmacists dispensing for example 100 milligram pills rather than the prescribed 50 milligram dose [13]. Poly pharmacy depicts lack of confidence among the health workers and could be a pointer of poor clinical competence of clinicians. Indeed the avalanche of diagnostic errors earlier discussed looks to confirm this suggestion. Other than increasing healthcare cost in either the provider or consumer's perspective, poly pharmacy is one of the drivers of the rising resistance to antimicrobial agents in many low-income countries. In addition, poly pharmacy could be associated with adverse events secondary to drug interactions. In the post-modern world threatened by high-level of antibiotic resistance, all efforts should be made to reduce this error to as minimum as possible.

Health workers mentioned poor pre-operative management as the highest surgical error they had witnessed in the hospital. However, on review of patient treatment records, we found that the commonest error identified was failure to write post-operative notes by doctors. This has an implication in that nurses giving post-operative care may give inappropriate treatment and care thus leading to either complications or delay to get better.

From our study, it is evident that no formal error reporting system exists in the study hospitals – unstructured verbal reporting commonly practiced. As a consequence, feedback on the reported errors was not given to either those who reported the errors or staff expected to learn from and take corrective action. Such practice of informal reporting of errors is not new since it has been reported elsewhere in Uganda [11]. Poor feedback on reported errors remains a big cause of none reporting in healthcare institutions. Similarly, fear of reprisal and litigation were big impediments to error reporting though litigation can only suffice after either error disclosure (to patient or relative) or self-discovery. The high mention of litigation as an impediment to error reporting depicts confusion among our respondents as to the distinction between error reporting and disclosure. This is not surprising given the low knowledge of our respondents on the advantages of error reporting to patients and health workers in our study hospitals – a pointer to general inadequate knowledge on medical errors; and the poor error reporting practices in Ugandan hospitals.

Failure to have a formal reporting system derails the practice of reporting errors and thus many may go unnoticed and the hospital staffs fail to learn from experience to prevent recurrence. Similarly, lack of feedback on reported errors not only de-motivates but also limits future action to prevent or report further errors. However, in the ART/HIV clinic of hospital 3, there is a system that helps to capture medical errors that are committed. For example, in the clinic, there was a fully fledged and functional monitoring and evaluation department. This sets a foundation for introduction of a standard error reporting system in the entire hospital.

The reporting system in this hospital contrasts what is agreed upon and internationally recognized WHO standards. According to the World Health Organization, there are two reporting systems recognized: the Accountability System – a mandatory reporting system which is restricted to a list of defined serious events such as unexpected death, transfusion reaction and wrong site surgery; and the Voluntary Reporting System whose objectives are to identify errors and hazards and to investigate them to uncover underlying system failures with a goal of redesigning the system to reduce the likelihood of patient injury[4]. Absence of either of the error reporting systems in these hospitals further demonstrates that the error reporting system may not help hospital staff to learn and reduce errors committed.

As regards attitude of the health workers towards error reporting a positive attitude was identified. Almost all

respondents reported that it was good to report errors/mistakes. This however contradicts what managers reported that many health workers do not report errors for fear of being punished. This implies that many health workers do not practice what they know is important. This finding from the managers about the negative attitude by the health workers about error reporting agrees with the findings from other studies where most of the health workers and managers had a negative attitude towards error reporting. Lawton and Parker in 2002 [14] and Waring in 2004 [9] report that many health workers had negative attitude towards reporting errors because of the fear of the repercussions when they reported. Such repercussions included being blamed for the error, punishment given to those who commit errors and fear of losing their jobs.

Introducing a formal reporting system in the hospital was suggested as one means to improve error reporting in the hospital with an office set up to manage error reporting. This agrees with the study done by Terzibanjanet al., who affirm that institutions and countries which had national and local agencies managing error reporting had more health workers reporting [15]. This is because such offices will receive the reports and analyze them and then give feedback to the reporting health workers and institutions thus encouraging more of the health workers to report.

Another author asserts that abolition of punishment to those who report errors encourages health workers to report[16]. In this study, this was also mentioned by all top managers of the hospitals as one way of motivating health workers to report mistakes made during medical practice.

These, they suggested, should be put in strategic areas where workers can put their concerns about medical error reporting. However in a standard error reporting system, suggestion boxes may not be required as the method requires openness and reporting to a centralized office which then disseminates lessons learned to all health workers [4].

5. Conclusions

This study has brought out common medical errors, error reporting practices and factors influencing error reporting in selected Ugandan hospitals. It highlights high occurrence of medication and diagnostic errors in virtually all the hospitals. Generally, no formal error reporting systems exist in the study hospitals despite high willingness for error reporting among healthcare providers and managers. Given that factors like reprisals, fear of ligation and poor feedback among others impede error reporting in these hospitals, managers should set up formal error reporting systems that should put the impediments reported herein at the focus of discussion (during process of setting up error reporting system) in order to create functional and fear-free error reporting systems. In the long run, the Ministry of Health of Uganda should engage the legislature to enact appropriate legislations that should create an environment ambient enough for error disclosure to patients and/or caretakers in order to allay the litigation-related fears of health workers.

References

[1] Linda TK, Corrigam JM, and Donalson MS. To err is human. Building a safer health system. Washington DC: Institute of Medicine, 1999.

[2] Blendon R.J, Desroches CM, Brodie M, Benson JM, Rosen AB, Schneider E, Altman DE, Zapert K, Herrmann JM and Steffenson AE. Views of Practicing Physicians and The Public on Medical Errors. The New England Journal of Medicine, 2002; 347(24): 1933-40.

[3] World Health Organization. World Alliance for Patient Safety: Towards a foward Programme. Geneva: World Health Organization Press, 2004 .

[4] World Health Organization. World Alliance For Patient Safety: WHO draft guidelines for advance event reporting and learning systems. from information to action. Geneva: World Health Organization Press, 2005.

[5] Edwards R. The WHO World Alliance for Patient Safety. A new challenge or an old one neglected. Drug Safety, 2005; 28(5): 379-86.

[6] Waring JJ. Beyond blame: cultural barriers to medical incident reporting. Social Science and Medicine, 2005; 60(9): 1927-35.

[7] Frankel A, Tejal KG and Bates DW. Improving patient safety across a large intergrated health care. International Journal of quality in Health Care delivery system, 2003; 15(1): 31-40.

[8] World Health Organization, Regional Office for Africa. Make patient safety a priority for Africa, 2002. Available at: file://G:pt%safety.html (viewed on 29th November 2011).

[9] Waring JJ. A qualitative study of the intra-hospital variations in incident reporting, *Int J Qual Health Care*, 2004; Vol.16, no 5:pp347-52.

[10] Wezel TB. Patient safety: minimizing medical error. CME, 2012; 30(11): 406-09.

[11] The Promota Magazine: Patient safety improvement in Africa (PASIMPIA). An interview with James Mwesigwa, nd. Available from: http://content.yudu.com/Library/A1ryxs/ThePromotaMagazineis/resources/28.htm. (Accessed on 3rd June 2015).

[12] Sandars J. The theoery and evidence base for clinical risk management, in Keith H and Malcom T, ed. Clinical risk management in primary healthcare. Oxford: Radcliffe Publishing, 2005.

[13] Kauffman M. 'Medication Errors Harming Millions'. Washington post, July, 2006, A08.

[14] Lawton R & Parker D. Barriers to incident reporting in a health care system. Quality and Safety in Health Care, 2002; 11: 15-18.

[15] Terzibanjan AR., Raisa L, Weiss M, Airaksinen M and Wuliji T, 2007. Medication error reporting systems – lessons learnt.

[16] Greens K., Blame free system increases medical error reporting (2011). [Internet]. Available from:www.reuters.com/.../us.blamefree.idUSTRE7A/NEWYORK, (Accessed 15th December 2011, 2:18).