

Research Article

Frequency of self-reported patient safety events in surgery and allied departments of two tertiary care hospitals of Peshawar

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ABSTRACT

Background: Patient Safety Events (PSEs) can have disastrous effects on a patient, the involved healthcare workers, and the organization in clinical practice. preventable PSEs harm about 10% of the admitted patients on average addition, the PSEs are often underreported due to the culture of name, blame, and shame in healthcare organizations There is limited research from Pakistan assessing the frequency of self- reported PSEs occurring in hospitals. This study aims to determine the frequency of self- reported PSEs in surgery and allied departments of two tertiary care hospitals of Peshawar District (Pakistan).

Methodology: This observational cross-sectional study was conducted at two tertiary care teaching hospitals of Peshawar District Data was collected from February 2016 to December 2016 from surgeons working in surgery and allied departments, using a pretested self- administered tablet-based questionnaire. Descriptive statistics were computed using SPSS version 20.

Results: Out of 65 surgeons participating in the study, 54% reported that they observed at least one PSE in last month with an average of 4.7 PSEs per reporting surgeon. Overall, the most common type of PSEs was those related to surgical technique (40%), followed by those due to poor coordination (31.4%).

Conclusion: PSEs commonly occur in hospitals and necessitate a system-wide improvement ranging from instituting a patient safety culture to better training, developing support systems for safer care (like reliance on IT. and checklists), and encouraging greater patient involvement in care.

Keywords: Patient safety, adverse events, frequency, surgery.

INTRODUCTION

Error literally means a mistake, it can also be considered as fallacy, wrong, inappropriate and incorrect. Errors usually Occur when one is careless or doing a task halfheartedly or one does not have proper knowledge of how to perform the task assigned to him [1].Medical errors occur due to the very same reasons. Medical error has been defined as an unintended act (either of omission or commission) or one that does not achieve its planned result the failure of a planned action to be completed as intended (an error of performance), the use of an improper plan to achieve an aim (an

error of planning) or a deviation from the process of care that may or may not cause harm to the patient. The role of error can be complex While many errors are non-consequential, an error can end the life of someone with a long-life expectancy or accelerate a looming death [3]. Medical errors are unavoidable and can have a disastrous effect on patient, treating doctor nurses and the organization as well. The word error in medicine is used as a label for nearly all of the problems harming patients. Medical errors are often described as human errors in healthcare.

Whether the label is medical error or human error, one definition used for it in medicine says that it occurs when a healthcare provider chooses an inappropriate method of care or improperly performs an appropriate method of care it has been said that the definition should be the subject of more debate [2].

A report on safety in healthcare by institute of medical publication, "To err is human", fixated attention on this problem, particularly its conclusion that every year more Americans die as a result of medical errors than deaths from the vehicle accidents and showed that there were up to 98,000 deaths per year because of medical errors [4]. Nearly all doctors have made mistakes but they often don't tell patients or families about them. In clinical practice human errors are common but they are generally underreported. As a result of this underreporting very little is known about the causes and consequences of medical errors. Moreover, fronting a medical error is very easy and hence it is not revealed. Often it is hard to recognize one's mistake, but it is essential to face the situation and try to learn from it so that future errors can be prevented. Identifying the risk factors for medical errors is a critical first step towards its prevention and is important goal of quality care assurance. Self-perceived medical errors are common among doctors and are associated with subsequent personal distress. As a consequence of medical error health care providers at all training levels experience feelings of guilt, disappointment, fear and sense of inadequacy of varying degree Impact of medical error on health care provider is a vital area deserving [5].

attention. Residents are vulnerable population whose early experience shapes their future behavior. Training period plays a critical role in defining physician's future practice and responses to medical error. Post graduate trainees and house officers often choose not to disclose their mistakes to their consultants. Trainees who have accepted responsibility for the mistake and have discussed it were more likely to report positive changes in practice. Trainees were less likely to make

changes if they attributed the mistake on job overload. Residents need special attention because behaviors learnt early in practice and more likely to continue on their late professional carrier [6]. For instance, the study of hand hygiene compliance of physicians in an ICU show that compliance varied from 19% to 85%. The deaths result from infections caught as a result of treatment providers improperly executing an appropriate method of care by not complying with known safety standards for hand hygiene and difficult to regard as innocent accidents or mistakes. At the least they are negligence's, if not dereliction, but in medicine they are lumped together under the word error from minor to major and causality is often poorly determined. Medical errors are associated with inexperienced physicians and nurses, new procedures and extremes of age and also complex or urgent care. Poor communication (whether in one's own language or as may be the case for medical tourists another language), improper documentation, illegible handwriting, inadequate nurse to patient ratios and similarly named medications are also known to contribute to the problem. Patient's actions may also contribute significantly to medical errors. Fails, for example, may result from patients own misjudgments. Human errors have been implicated in nearly 80 percent of adverse events that occur in complex healthcare systems. The vast majority of medical errors result from faulty systems and poorly designed processes, versus poor practices or incompetent practitioners. Complicated technologies, powerful drugs, intense care and prolonged hospital stay can contribute to medical errors. Poor communication and unclear lines of authority of physicians, nurses, and other care providers are also contributing factors. Disconnected reporting systems within a hospital can result in fragmented systems in which numerous hands-offs of patients results in lack of coordination and errors [7].

Other factors include the impression that action is being taken by other groups within the institution, reliance and automated systems to prevent error

and inadequate systems to share information about errors, which hampers analysis of contributory causes and improvement strategies. Cost-cutting measures by hospitals in response to reimbursement cutbacks can compromise patient's safety. In emergencies, patient care may be rendered in areas poorly suited for safe monitoring. The American Institute of Architects has identified concerns for the safe design and construction of healthcare facilities. Infrastructure failure is also a concern. According to the World Health Organization (WHO), 50% of medical equipment in developing countries is only partly useable due to lack of skilled operators or parts as a result, diagnostic procedures treatments cannot be performed, leading to substandard treatment [8].

Variations in health care provider training & experience and failure to acknowledge the prevalence and seriousness of medical errors also increase the risk. Sleep deprivation has also been cited as a contributing factor in medical errors. One study found that being awake for over 24 hours caused medical interns to double or triple the number of preventable medical errors, including those that resulted in injury or death. The risk of car crash after these shifts increased by 168%, and the risk of near miss by 460%. Interns admitted falling asleep during lectures, during rounds, and even during surgeries. Night shifts are associated with worse surgeon performance during laparoscopic surgeries. Practitioner risk factors include fatigue, depression, and burnout. Factors related to the clinical setting include diverse patients, unfamiliar setting, time pressures and increased patients to nurse staffing ratios increases. Drugs names that look alike or sound alike are also a problem [9]. The most commonly quoted approximation of annual deaths from medical error US, a 1999 Institute of Medicine (IOM) report is narrow and obsolete. The report describes an incidence of 44000 – 98000 deaths annually [2]. This conclusion was not based on primary research conducted by the institute but on the 1984 Harvard Medical Practice Study and the 1992 Utah and Colorado Study [3]. But as early as

1991, Leape, a chief investigator in the 1984 Harvard study, published an article arguing that the study's estimate was too low, challenging that 78% rather than 51% of the 180000 iatrogenic deaths were preventable (some argue that all iatrogenic deaths are avoidable) [10]. This higher incidence (about 140,400 deaths due to error) has been supported by subsequent studies which suggest that the 1999 IOM report underestimates the magnitude of the problem A 2004 report of inpatient deaths associated with the Agency for Health Care Quality and Research Patient Safety Indicators in the Medicare population estimated that 575,000 deaths were produced by medical error between 2000 and 2002, which is about 195,000 deaths a year [11]. Likewise, the US Department of Health and Human Services Office of the Inspector General examining the health records of hospital inpatients in 2008, reported 180,000 deaths due to medical error a year among Medicare beneficiaries alone. Using similar methods, Classen et al described a rate of 1.13%. If this rate is applied to all registered us hospital admissions in 2013 it translates to over 400,000 deaths a year, more than four times the IOM estimates. Similarly, Landrigan et al. reported that 0.6% of hospital admissions in a group of North Carolina hospitals over six years (2002 – 07) resulted in deadly adverse events and conservatively estimated that 63% were due to medical errors. Extrapolated nationally, this would translate into 134,581 inpatients deaths a year from poor inpatient care. Of note, none of the studies captured deaths outside inpatients care, those resulting from errors in care at home or in nursing home outpatient care such as ambulatory surgery centers. A literature review by James estimated preventable adverse events using a weighted analysis and described an incidence range of 210,000 – 400,000 deaths a year associated with medical errors among hospital patients. A calculated mean rate of death from medical error of 251,454 a year using the studies reported since the 1999 IOM report and extrapolating to the total number of US hospital admissions in 2013. This devalues the true

incidence of death due to medical error because the studies cited rely on errors extractable in documented health records and include only inpatient deaths. Although the assumptions made in extrapolating study data to the broader US population may limit the accuracy of our figure, the absence of national data highlights the need of systematic measurement of the problem. Equating our estimate to centers of Disease Control and Prevention (CDC) ranking suggests that medical errors is the third most common cause of death in the US [12].

Medical care is frequently compared adversely to aviation; while many of the factors that lead to errors in both fields are similar, aviation's error management protocols are regarded as much more effective. Safety measures include informed consent the availability of a second practitioner's opinion, voluntary reporting of errors, root cause analysis, reminders to improve patient medication adherence, hospital accreditation and systems to ensure review by experienced or specialist practitioners. A template was developed for the design (both structure and operation) of hospital medication safety programs, particularly for acute tertiary settings, which emphasizes safety culture, infrastructure, data (error detection and analysis), communication and training [13].

Particularly to prevent the medication error in the perspective of the intra-thecal administration of local anesthetics, there is a proposal to change the presentation and packaging of the appliances and agents used for this purpose. One spinal needle syringe prefilled with the local anesthetic agents may be marketed in a single blister pack which will be peeled open and presented before the anesthesiologist conducting the procedure. In the United States, adverse medical event reporting systems were mandated in just over half of the states as of 2014, a figure unchanged since 2007. In US hospitals error reporting is a condition of payment by Medicare. An investigation by the Office of Inspector General, Department of Health and Human Services released January 6, 2012 found that most errors are not reported and even in the case of errors that are reported and

investigated changes are seldom made which would prevent them in the future. The investigation revealed that there was often lack of knowledge regarding which events were reportable and recommended that lists of reportable events be developed. These are the common misconceptions about patient's safety events, and the arguments and explanations against those misconceptions are explained, "Bad apples" or incompetent healthcare providers are a common cause. Although human error is commonly an initiating event, the faulty process of delivering care invariably permits or compounds the harm and is the focus of improvement. High risk procedures or medical specialists are responsible for most preventable adverse events. Although some mistakes, such as in surgery are harder to conceal as errors occur in all levels of healthcare. Even though complex procedures entail more risk, adverse outcomes are not usually due to error, but to the severity of the condition being treated. However, USP has reported that medication errors during the course of a surgical procedure are three times more likely to cause harm to a patient than those occurring in other types of hospital care. If a patient experiences an adverse event during the process of care, an error has occurred. Most medical care entails some levels of risk and there can be complications or side effects, even unforeseen ones, from the underlying condition or from the treatment itself [15].

This research will highlight the need to improve patient safety events. It is a mean to assess whether these events are brought on by health care or health care management, state of adverse events among the patient is an indication of patient safety events, which is public health issue it is a commonly used method for estimating national incident, nature and preventability of adverse events. This study will lead to increase sense of urgency to improve patient safety and to global directions for hospital safety improvement programs This serves as a source of learning and is essential for improving patient safety. Such reports should be investigated and response to

these results guards to improve healthcare system to prevent recurrence of patient safety events and error in healthcare. Effective communication, education, good team work, appropriate duty timing and training of healthcare professionals in our country on patient safety skills will go a long way to ensure patient safety in the health system [16].

OBJECTIVES

The objectives of the present study were:

1. To determine the frequency of surgical patient’s safety events among surgical clinical of two tertiary care Hospitals of Peshawar District.
2. To compare the surgical patient’s safety events among clinical surgical specialties of two tertiary care Hospitals of Peshawar District.
- 3 To determine the types of surgical patient’s safety events among surgical hospitalization of two tertiary care Hospitals of Peshawar District.

METHODOLOGY

This observational cross-sectional study was conducted at two tertiary care hospitals in Peshawar over a span of eleven months i.e. from February 2016 to December 2016. Both are well-reputed hospitals that conduct inpatient surgeries. Study subjects were drawn from Surgery and Allied departments and included full-time employed professors, medical officers, training medical officers, house officers and consultants. The inclusion of such front-line personnel added both credibility as well as increased efficacy of incidence-reporting process. The identities of all participants were kept confidential due to legitimate concerns over performance records. There are various ways to collect data. Our survey format was an electronic questionnaire saved into a tablet which was handed to the subject for completion. This format of choice was

economical, efficient as well as time-saving for us. 65 doctors were asked to fill the questionnaire among which were 25 house officers, 14 were medical officers, 7 were training medical officers, and 19 were consultants. A member of the research team would introduce and explain the research project after which the tablet was handed over to the subject to fill the questionnaire within a given time. Completed questionnaire was retrieved on the spot. Permission for this survey was granted by Prime Institute of Public Health. Data is analyzed using SPSS data analysis program version 20 which provides us an easy comprehension of our result. Using this software, we have deduced the frequency of patient safety events in different departments of surgery. Moreover, we also compared the types of patient safety events. Not just this but using this data we were able to compare the percentage of males and females reporting PSEs. For this study we followed a relatively broad definition of what constitutes a Patient safety event, recording events both with and without resulting harm to the patient, and recorded events as well as 'near misses'.

RESULTS:

The data was collected from doctors present in surgery and allied units from February, 2016 to December, 2016. A tablet-based questionnaire was filled by all consultants, TMOs, MOs and House Officers of the respective departments. Total number of doctors were 65 from both hospitals (33 from Hospital A and 32 from Hospital B) out of which 33 were male and 32 were female. Out of these 19 were consultants, 7 were TMOs, 14 were MOs and 25 were house officers, (Table-I).

Table-I: - Comparison of Hospitals by Gender and Healthcare Workers’ Designation

| Category | Detail | Hospital "A" | | Hospital "B" | | Total | |
|-------------|-----------------|--------------|------------|--------------|------------|--------|------------|
| | | Number | Percentage | Number | Percentage | Number | Percentage |
| Gender | Male | 22 | 33.8 | 11 | 16.9 | 33 | 50.7 |
| | Female | 11 | 16.9 | 21 | 32.4 | 32 | 49.3 |
| Designation | Consultants | 11 | 16.9 | 8 | 12.4 | 19 | 29.3 |
| | Non-consultants | 22 | 33.8 | 24 | 36.9 | 46 | 70.7 |

There were 25 doctors from general surgery, 17 from Gynae/Obs, 5 from ophthalmology, 6 from E.N.T and remaining 12 from other specialties (Table-II).

Table-II: - Clinical Specialty Wise Distribution of the Participants

| S No | Clinical/Surgical Specialty | Number | Percentage |
|------|-----------------------------|--------|------------|
| 1 | General | 25 | 38.4 |
| 2 | Obstetrics and Gynecology | 17 | 26.1 |
| 3 | Orthopedic | 3 | 4.7 |
| 4 | Ophthalmology | 5 | 7.7 |
| 5 | ENT | 7 | 10.7 |
| 6 | Anesthesiology | 5 | 7.7 |
| 7 | Other | 3 | 4.7 |
| 8 | Total | 65 | 100 |

The duration of practice years of the surgeons who participated in the study is shown in Table-III.

Table-III: - Duration of Surgical Practice

| S No | Category Practice Years | Number | Percentage |
|------|-------------------------|--------|------------|
| 1 | .5 – 15 | 57 | 87.6 |
| 2 | 16 – 30 | 5 | 7.7 |
| 3 | 31 – 45 | 3 | 4.7 |

Regarding patient’s safety events observed during last one month by different surgeons, 30 (46.2%) reported that they didn’t observed any patient’s safety event whereas 35 (53.8%) reported that they had observed patient safety events.

Patients Safety Events observed varied from 01 – 18 by different doctors (mean 4.7, SD ± 0.78).

Types of patient’s safety events commonly seen were surgical technique related (40%) followed by poor coordination (31.4%). Table-IV

Table-IV: - Types of Patient Safety Events (PSEs) by Overall Experience in Different Surgical Units of Both Hospitals.

| S No | PSEs Type | Frequency | Percentage |
|------|----------------------------|-----------|------------|
| 1 | Medication | 3 | 8.5 |
| 2 | Falls during Hospital Stay | 1 | 3 |
| 3 | Surgical Technique | 14 | 40 |
| 4 | Poor Coordination | 11 | 31.4 |
| 5 | Other | 6 | 17.1 |
| 6 | Total | 35 | 100 |

Patients safety events were seen mostly during post-operative phase of care (51.4%) as compared to intra-operative or pre-operative care phase.

Table-V: - Patient Safety Events During Different Phases of Care

| S No | Care Phase | Frequency | Percentage |
|------|-----------------|-----------|------------|
| 1 | Pre-Operative | 7 | 20 |
| 2 | Intra-operative | 10 | 28.6 |
| 3 | Post-operative | 18 | 51.4 |
| 4 | Total | 35 | 100 |

The mean of the PSEs reported by the house officers was more as compared to the mean of PSEs reported by MOs, TMOs and consultants. (Table-VI)

Table-VI: - Mean of the PSEs Reported by Healthcare Workers.

| S No | Designation | Mean | Number | SD |
|------|-----------------|------|--------|-------|
| 1 | House Officer | 5.33 | 15 | 1.952 |
| 2 | Medical Officer | 3 | 4 | 1.414 |
| 3 | TMOs | 2.75 | 4 | 2.062 |
| 4 | Consultants | 3.09 | 11 | 2.166 |
| 5 | Total | 4.03 | 34 | 2.236 |

When the two hospitals were compared, the events were seen more in hospital A as compared to Hospital B. (Table-VII).

Table-VII: - Comparison of Hospital-A and Hospital-B

| S No | PSEs Type | Hospital "A" | Hospital "B" | Total |
|------|----------------------------|--------------|--------------|-------|
| 1 | Medication | 1 | 2 | 3 |
| 2 | Falls during Hospital Stay | 0 | 1 | 1 |
| 3 | Surgical Technique | 8 | 6 | 14 |
| 4 | Poor Coordination | 10 | 1 | 11 |
| 5 | Other | 2 | 4 | 6 |
| 6 | Total | 21 | 14 | 35 |

DISCUSSION

Patient safety begins before a patient enters a hospital and it calls attention to all preventable medical errors. It requires the attention of all personnel ranging from doctors, nurses to other technical and other staff involved in patients care. The present study was aimed to see patient safety events through self-reporting by doctors of surgery and allied departments.

For the safety of patients in surgery and allied departments, it is important to know about the most common errors on the part of healthcare workers. Healthcare workers make medical errors in every clinical practice which is usually ignored or not reported. Patients safety events can be due to fatigue, due to long duty hours. Lack of experience or job over load.

Our results were 53.8% which means 35 out of 65 people reported about errors. As compared to only published study in Pakistan by Attia Bari et al. who had reported the frequency to be 66% which was significantly higher than our study [8]. This higher rate is probably due to that study was carried out only on residents.

Similar study was carried out in two states of US, Utah and Colorado by Atul A Gawande et al. who

had reported 66% adverse events in surgical patients in 1992 [9].

Thomas et al. conducted the study in the same states of US in 2000 and he showed the decrease in the adverse events. He reported the mean errors to be 32.6% in Utah and 27.4% in Colorado [20]. This shows that the incidence of PSEs is less in US as compared to our study which might be due to good quality of healthcare system and check and balance.

Other studies of the occurrences of patient safety events reported widely varying prevalence rates. These studies mostly involved incident reporting, although patients reported incidents or malpractice claims have been researched as well. But none of these studies evaluated the different types of adverse event giving us a clearer picture of surgical categories [11, 12]. Only one study of US healthcare system in 2014 evaluated the different types of PSEs [13].

The further linking of patient safety event rate within surgical categories to specific varieties of adverse events further refines the ability of quality improvement personnel and surgeons to identify strategies for diminishing patient's safety event risks.

Our results were very different from those evaluated in US healthcare facility. In our study the leading cause of patient safety event was surgical techniques, which was as high as 40% in the overall experience of the unit, while according to the other study the leading cause was care management with a percentage as high as 20.77% [13].

The difference can be presumed to be due to the fact that we are a developing country which is in a dire need of advancements in the field of surgery. Moreover, when we state about surgical techniques it is not just the incompetency of the consultants we are pointing at but the underlying cause could be misreporting by the staff. This misreporting itself is a consequence of poor condition. The reason for surgical errors could be lack of standardized surgical protocols, poor teamwork and coordination between surgical teams, no use of standardized checklists, and problems with surgical instruments and devices (e.g. unsterilized or faulty devices).

Moreover, after surgical techniques is poor coordination with percentage of 31.4% while the other study reported errors of medication with 19.18% as the second leading cause of patient safety event.

We also found out that surgical patient's safety events are more in which phase of patient care; i.e. in pre-operative, operative or post-operative phase. According to our research surgical patient's safety events are more in post-operative phase (51.5%).

A research was performed in 2003, where they also have seen frequency of medical errors in different phases of patients care. Their results are as follows; Two third of the incidents involved errors during the intra-operative phase of surgical care, 27% during pre-operative management and 22% during post-operative management [14].

In another study, surgical procedures were performed in 15,100 patients. Of those, 151 patients had a CIED related adverse events during the pre-intervention period and none during post intervention period [15].

There is another study in which data on pre-operative and intra-operative variables was analyzed. 13 patients underwent LYMPHA with intra-operative fluorescein isothiocyanate lymphatic mapping. No intra-operative adverse events were observed. Thus, fluorescein isothiocyanate is a safe and effective method for intra-operative lymphatic mapping.

In another research, 773 patients required reoperation within 30 days of their index pancreatectomy. These patients were more likely to have lower pre-operative serum albumin, were young, male and also respiratory co-morbidities. Other factors included longer mean operative duration at index procedure, post-operative transfusion requirements, wound complications and infectious events. In another study out of 56,217 orthopedic trauma patients, 749 developed post-operative adverse cardiac events. It shows that orthopedic trauma patients sustaining post-operative cardiac events have longer hospital stay as compared to those who do not have developed cardiac complications. Fortunately, errors can be minimized with proper training, effective communication and system of check and balance. Reducing unintentional harm to patients will require active training of all personnel in academic centers and their applicability to daily practice. Only then can we ensure a safe reliable environment and delivery of high quality care for patients.

Strength of the present study was that it was a unique study of its kind that PSEs were voluntarily reported by the surgeons themselves and it covered all the surgical departments of the two teaching hospitals. Moreover, no such study had been published in Peshawar District. Limitations of the study were that it was conducted in surgical and allied departments of only two hospitals of Peshawar because of the time constraints. More consultants from other teaching hospitals should have been involved. Moreover, it did not include medicine and allied departments. The study relied only on self-reported

information by the doctors and did not include the information from the patients or patient's charts.

CONCLUSION

PSEs occur in hospitals where they impose positive amendments in the system. The scale of amendment ranges from promoting a patient safety culture to improved training program. They also focus on developing a support system with ability to minimize errors to their least extent so that the patients can rely on checklists and IT. Errors can be minimized with effective communication, proper training and a system of check and balance. These trainings shall be provided to all the faculty members during their academic sessions after which a supervised practice should be conducted. Only then a safe system can be assured where unintentional harm to the patients can be minimized. The extreme cases of PSEs incidence reflect the safety issues of patients in clinical units. Hospitals must trace and identify units that bear highest ratio of PSEs incidence so that on time remediation can be applied to minimize the risk factor. Furthermore, another sub-analysis should be conducted to determine the patterns of particular type of PSEs to enhance patient safety efforts and quality assurance.

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