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The reporting of adverse events in Johannesburg academic emergency departments

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The reporting of adverse events in Johannesburg Academic Emergency Departments

Matthew Gabriel Zoghby

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A dissertation submitted to the Faculty of Health Science, University of the Witwatersrand, in fulfilment of the requirements for the degree of Master of Medicine (Emergency Medicine).

Johannesburg February 2019

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DECLARATION

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

FACULTY OF HEALTH SCIENCES

PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

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I hereby declare the following:

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- I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.
- I have included as an appendix a report from "Turnitin" (or other approved plagiarism detection) software indicating the level of plagiarism in my research document.

Signature:  Date: 29/10/2019

ABSTRACT

Background. Adverse events (AE) are a common occurrence in healthcare systems; however, the frequency of AEs occurring in South Africa and especially Emergency Departments (ED) is unknown.

Objectives. To describe the frequency of AEs experienced by Healthcare providers (HCP) and the frequency of formal reporting thereafter over a 12-month period.

Methods. A cross sectional descriptive study was performed amongst HCPs at Helen Joseph Hospital and Chris Hani Baragwaneth Academic Hospital EDs. One hundred completed questionnaires were received. Whilst the primary outcome was the number of AEs experienced and reported over a 12-month period, other outcomes included perceived barriers to AE reporting.

Results. One hundred questionnaires were analysed including 51 doctors and 49 nurses. All HCPs experienced at least 10 AEs over 1 year but only enrolled nurses (60%) and professional nurses (35%) reported at least 10 AEs. Nurses were 21 times more likely to report at least 10 AEs ($p < 0.0001$). Twenty four percent of AEs were deemed minor. Barriers to AEs were assessed with 'no feedback was given', 'lack of time' and 'being unaware of the reporting processes' being the most common.

Conclusion. There are low levels of formal AE reporting, especially amongst doctors, within Johannesburg Academic EM Departments despite large numbers of AEs experienced. There are multiple barriers, which influence these reporting practices. Improved reporting systems are needed to affect a change in the current environment.

ACKNOWLEDGEMENTS

Many thanks to all the ED staff who completed the questionnaires.

My Dad for help with Excel.

Dr Allison Bentley for her time and effort.

My supervisor Dr Deidre Hoffman, for all her time and effort from the first draft until the final document. As well as Dr Zeyn Mahomed for his encouragement and expertise.

Lastly, Kate, who has always believed in me and provided much love and support throughout the MMed process.

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INTRODUCTION

In 1999 the Institute of Medicine published the landmark study "To err is human" describing the unacceptable rates of Adverse Events (AE) occurring within the American healthcare system and the need for wide scale system changes (1). Levinson later defined an AE as "harm to a patient as a result of medical care or in a health care setting"(2). The South African National Procedural Manual for Patient Safety Incident Reporting and Learning mirrors this definition with "harm to a patient that is related to medical management"(3).

Kohn et al. emphasized that basic patient safety in healthcare was lacking and that systems should be designed to make 'it hard for people to do the wrong thing and easy for people to do the right thing'(1).

Though American healthcare has seen an increase in the incidence of AEs over the past forty years, this may well be the result of improved AE detection and better documentation, rather than poorer patient safety (2,4). Brennan et al. further estimated that 3% of all AEs originated in the ED, however this was viewed as an underestimate as the study focused on inpatients (4,5). Later studies estimated a higher incidence of ED AEs at 5% (5). Reasons for increased risk of ED AEs include patient factors (complex case presentations, severity of illness and increased patient load) and factors related to Healthcare Providers (HCP) (limited time per patient, lack of sleep, recurrent interruptions and different levels of experience) (6). Errors in the ED are multifactorial and occur at different phases of the patient's ED visit from triage, examination and intervention to admission, discharge and/or handover (7).

The latest 2016 South African National Procedural Manual for Patient Safety Incident Reporting and Learning states that there are no statistics available regarding AEs occurring within South African state sector hospitals due to a variety of administrative reasons (3). Reporting systems and AE reporting within the smaller private healthcare sector may be more structured; however, limited data is available for public scrutiny. There is also no formal data concerning AEs occurring within South African hospital EDs and reporting thereof. This study serves to highlight the frequency and reporting of AEs occurring within two state sector Johannesburg EDs according to the demographics of HCPs. Barriers to reporting of AEs will be highlighted.

MATERIAL AND METHODS

DESIGN AND SETTING

This was a cross-sectional descriptive study approved by the Human Research and Ethics Committee of the University of the Witwatersrand (M171119). Data was collected during the month of May 2018 in the Johannesburg Academic EDs of Chris Hani Baragwanath Academic Hospital (CHBAH) and Helen Joseph Hospital (HJH). The AE questionnaire (appendix 1) had been used by Evans et al. in Australia and was used to assess their incident reporting system and the reasons preventing the reporting of incidents (8). This questionnaire was adjusted for the South African ED setting (appendix 2) to incorporate *ED* relevant AEs using the National Procedural Manual for Patient Safety Incident Reporting and Learning (3). Certain questions have been expanded from yes/no answers to answers encouraging descriptive explanation and the final table has been modified to add "other" as an option to encourage further reasons for poor adverse event reporting behavior.

SELECTION OF PARTICIPANTS AND DATA COLLECTION

Study participants were HCPs working within CHBAH and HJH EDs, including qualified and registered medical doctors (interns, community service medical officers, medical officers, registrars or specialist consultants) and qualified and registered nurses (professional nurses, staff nurses or enrolled nursing assistants). Exclusion criteria were medical and nursing students and/or unregistered medical or nursing practitioners. All eligible and willing HCPs completed the questionnaire. Consent was inferred by their choosing to complete the questionnaire. No identifying information was captured and completed questionnaires were anonymously placed in a sealed and secured box.

DATA PROCESSING

Study data was collected and managed using REDCap (Vanderbilt University, USA) electronic data capture tools hosted at Witwatersrand University. Raw data was thereafter exported and analysed in Excel 2016 (Microsoft, USA) and statistical analysis performed using SPSS Statistics 25 (IBM, USA).

The National Procedural Manual for Patient Safety Incident Reporting and Learning was compiled during 2016 with the primary purpose of improving awareness and reporting processes of AEs as well as the steps to follow after an AE has occurred (3). Similar adverse events are grouped according to the National Procedural Manual for Patient Safety Incident Reporting and Learning (3) as below:

Table 1. Groups of adverse events

Clinical procedures and administration	Patient didn't receive necessary treatment, procedure performed without written/verbal consent
Clinical process	Pressures sores acquired in the ED, maternal death
Resources	No beds available for admission, understaffing
Medication	Medicine not available, incorrect drug given, incorrect drug dose given
Medical devices	Missing equipment, equipment fault resulting in patient harm
Blood products	Acute blood transfusion reaction
Patient accidents	Patient injury due to fall in the ED
Behavior	HCP physically/verbally assaulted by a patient, HCP physically/verbally assaulted by another staff member, absconded patient

Results for different adverse events were pooled together in the above-mentioned groups with a denominator of completed responses to that question.

To compare AEs experienced, the AEs of each participant were summated using the mean of each group (1-5, 6-10, 11-20 and >20). The total value was then split into the categories of AE reported (≤ 10, >10). The AEs reported were then divided into the same groups of ≤ 10 and >10 and cross-tabulated with HCPs. Thereafter Pearson Chi^2 test was applied.

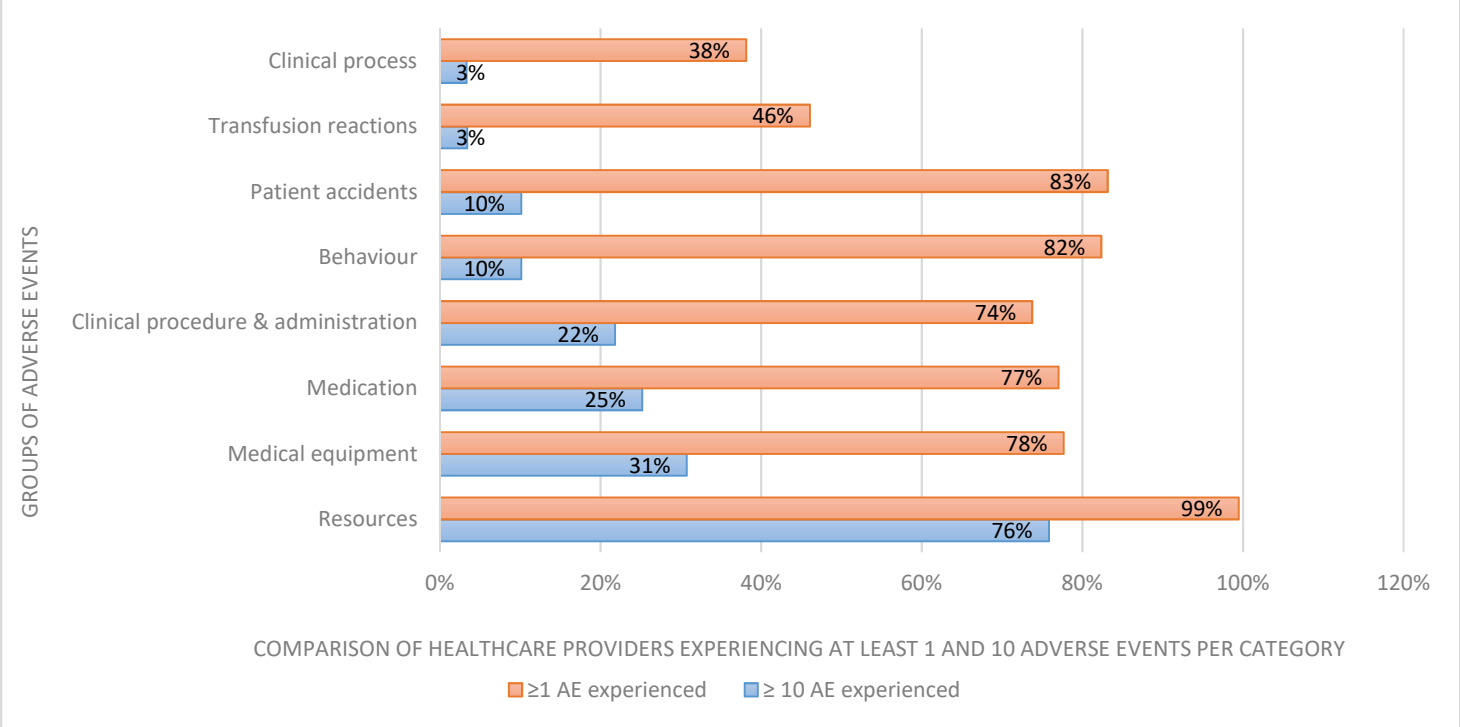
Adverse events experienced were graded in the questionnaire using a Likert scale ranging from 'extremely major' to 'not adverse'. The categories of 'minor', 'very minor' and 'not adverse' were then grouped together and expressed as a percentage over the total number of replies.

Barriers to adverse event reporting were evaluated using a Likert scale ranging from 'strongly agree' to 'strongly disagree' and then depicted graphically.

RESULTS

One hundred HCPs participated of which 51 were doctors and 49 nurses with 57 females and 43 males. There was 10% data missing due to partially completed questionnaires and results were adjusted accordingly.

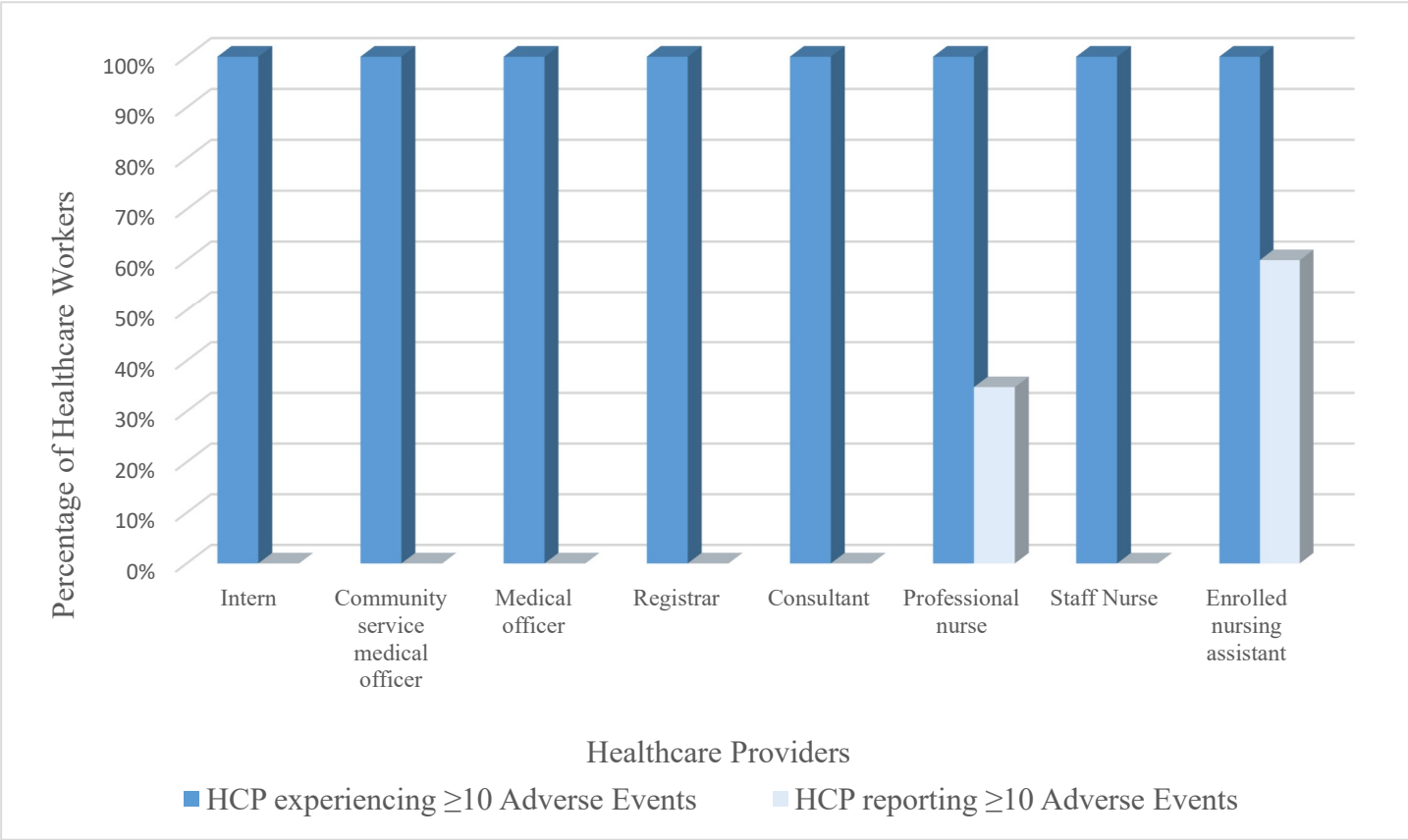
Figure 1. Adverse Events experienced by Healthcare Providers



There is large number of AEs experienced in all AE groups, however once a minimum of 10 AEs experienced was analysed, a clearer pattern emerged of the commonest AEs experienced by HCPs in the ED.

A portion of the questionnaire determined perceptions of HCPs towards the AEs they experienced and at least 24% across all AEs categories was deemed by HCPs to be 'minor', 'very minor' or 'not adverse'.

Figure 2. Percentage of Healthcare Providers experiencing and reporting at least 10 Adverse Events

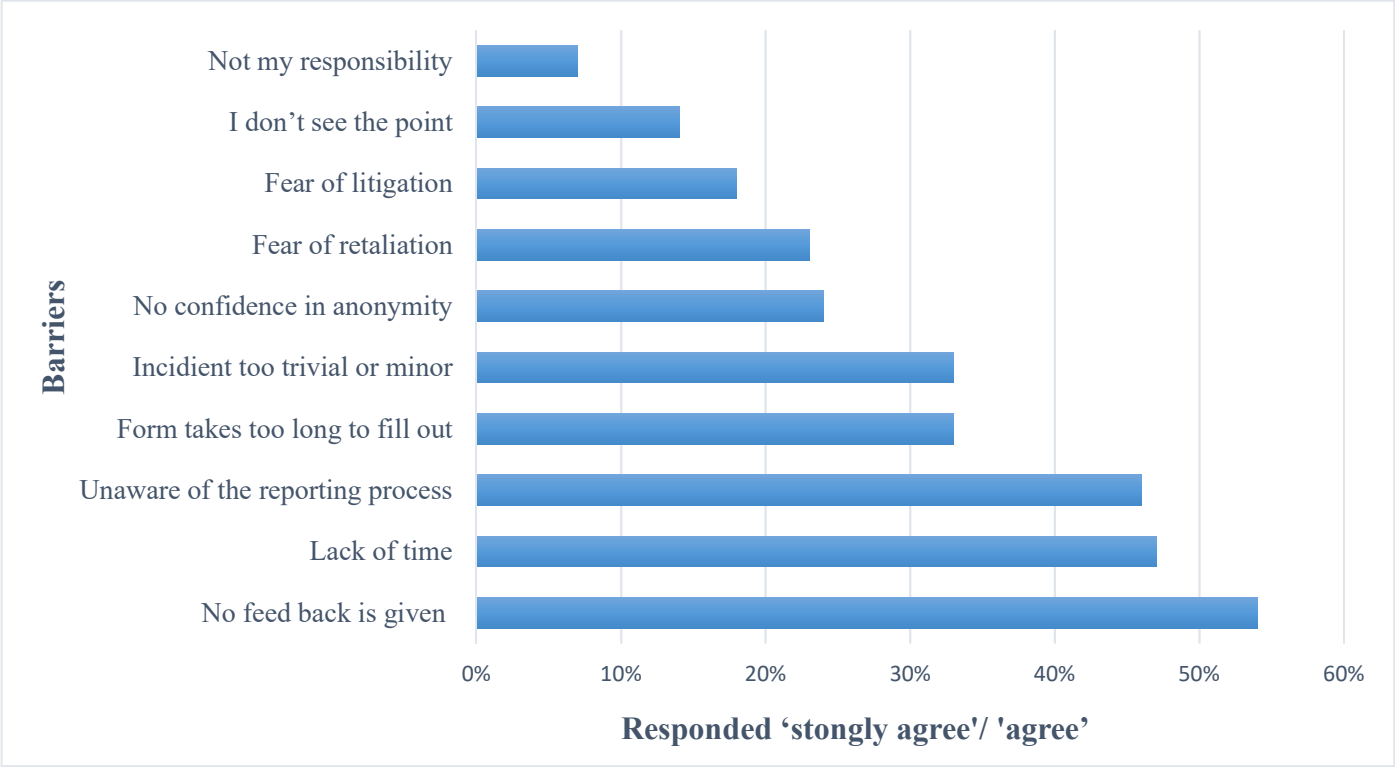


Despite large numbers of AEs experienced, many doctors had not reported a single AE in the past 12 months.

All HCPs experienced at least 10 AEs in a year period, however it was statistically significant that nurses consistently reported at least 10 AEs when compared to doctors (Chi^2 coeff: 16,845, df=1, $p < 0.0001$). A nurse was 21 times more likely than a doctor to report at least 10 AEs ($p < 0.0001$). The only HCPs to report at least 10 AEs were enrolled nurses (60%) and professional nurses (35%).

There was no significant difference between reporting and non-reporting of AEs amongst male and female HCPs (Chi^2 coeff: 2.946, df = 1, $p = 0.086$). Using linear regression there is no correlation between years post qualification and number of AEs reported ($r = 0.02234$, $p=0.8392$).

Figure 3. Barriers to Adverse Event reporting



The commonest barriers to AE reporting are 'no feedback was given', 'lack of time' and 'being unaware of the reporting processes.' Other barriers either received ambivalent answers or were rejected as a reason for poor reporting practices.

DISCUSSION

AE data within South Africa is poorly documented but the incidence of AEs is expected to be high as South Africa is Low Middle Income Country (LMIC) with fewer resources and a higher patient to doctor ratio (9,10). In the latest South African Health Review 2017 there is no data regarding the incidence of AEs occurring within the Department of Health, although it does look at drug AEs (10). During 2008, Free State government hospitals reported nearly 400 incidents shortly after introducing a new reporting system, of which 29.5% were deemed serious, however the proportion which originated from the ED is unknown (9). Due to the sudden awareness of high AEs being experienced using the Advanced Incident Management System (AIMS), investigators feared lack of further buy-in from clinicians, hospital managers and government leadership(9). Sadly, no further data was published.

Within two Johannesburg (JHB) state EDs, we demonstrated numerous AEs experienced by HCPs in a 12-month period. The top three AEs experienced in these two EDs, namely resource-related AEs (lack of admission beds and HCP shortages), together with 'medicine' and 'medical equipment', play a pivotal role in the quality of healthcare delivered within the ED and the hospital as a whole. A shortage of HCPs suggests South Africa is struggling to meet the third Sustainable Development Goal of increasing 'health financing and the recruitment, development, training and retention of the health workforce in developing countries'(11).

Compared to the two JHB EDs, EDs in the Netherlands demonstrated a different hierarchy of AEs experienced, namely 'collaboration with other departments'(24.5%), 'materials and equipment'(20.3%), 'collaboration with resident physicians & consultants'(17%) and 'diagnosis and treatment'(14.4%) (7). Within the Dutch EDs AEs related to medication amounted to a much lower 7.3% (7). This contrast in AE hierarchies highlights the different healthcare concerns experienced in low middle and high-income countries

All HCPs working in the ED experienced at least 10 AEs, however doctors' AE reporting rates are in keeping with poor AE reporting practices globally (14–16). Within a twelve-month period in JHB EDs, 57% of doctors reported no AEs. This is similar to Evans et al., where 40% of registrars and consultants from South Australian hospitals in a variety of clinical areas, including ED, had never reported a single AE (8). Harper et al. proposed that doctors report fewer AEs due to a belief that AEs are an administrative process which falls under the responsibility of the nurse attending to the patient (17). Doctors are also unwilling to admit to mistakes outside of the theoretical situation and thereby reporting an AE possibly signifies weakness (14). Conversely many doctors may have limited AE education while training and therefore when working as a qualified HCP may be unaware of what or how to report an AE (18). Another issue is lack of support for HCPs working within constrained hospital systems, where focused management input around processes and policies is desperately needed.

There may be numerous AEs unreported in JHB EDs possibly because a quarter of AEs experienced were deemed as 'minor', 'very minor' or 'not adverse'. This may be a major barrier to reporting (12)(13). Chamberlain et al. (12) elaborates that HCPs are poor at predicting outcomes of medical events and that a time interval may be necessary to ascertain whether an event was harmful or not. When HCPs define an AE as harmless, they 'justify avoiding disclosure'(12). When HCPs begin recognising these near-misses or potentially harmful incidents as errors and reporting them, we will improve patient care by preventing further and maybe more harmful events occurring in the future(14).

In this JHB ED study years post qualification showed no correlation however Evans et al. demonstrated junior doctors and nurses were more likely to report certain AEs (8). This may be as seasoned HCPs who experience regular AEs, within a dysfunctional system, may develop a blasé attitude towards the reporting of AEs, especially those where no obvious harm has occurred. Recently qualified HCPs are more likely to follow the relevant steps after an AE has occurred, however fear of retaliation and lack of anonymity as found in JHB EDs may hinder this process. There are no previous studies comparing reporting practices of male and female HCPs and this JHB ED study showed no difference. In a healthcare system with clear, consistent guidelines around AE reporting as well as an easy to use, mandatory reporting system, demographic factors affecting AE reporting could be more easily explored and differences found.

There are numerous known barriers to reporting (2,14,17). In this study, the most common barriers were being unaware of the reporting process, lack of time and no feedback given. Voluntary, as opposed to protocolised or incentive based, reporting of AEs is associated with reduced reporting and if HCPs are unaware of the reporting process, voluntary reporting will be significantly less (6,14).'Lack of time' is another marker of an understaffed health system, which is experiencing large patient volumes as is seen in LMICs (10). Harper et al. (17) noted that over 80% of HCPs would be more likely to voluntarily report AEs if they were given feedback about strategies and effective changes in their ED to help prevent further AEs from occurring.

Evans et al. demonstrated comparable barriers being experienced by HCPs in Australian hospitals (18). Thereafter investigators intervened with education for HCPs regarding AEs, improved feedback to HCPs and introduction of a simplified reporting system (AIMS), which resulted in increased voluntary AE reporting by ED doctors (18).

Within Gauteng government hospitals, the media reported that 20 417 patients have been harmed since 2016, which includes 4 320 at CHBAH and 1 044 at HJH (19). In this JHB ED study, over 1 year at CHBAH and HJH, at least 10 000 AEs have been experienced by 100 HCPs in the ED alone. This gross mismatch in figures of AEs being experienced and officially reported once again emphasises the need for improved incident detection, AE reporting and standards of patient care.

LIMITATIONS

This was a small study of only 100 participants, all of whom were HCPs at two Johannesburg state academic hospitals. Questionnaires were self-administered. There is limited data from the two JHB state EDs regarding AEs reported prior and therefore this JHB ED study is ultimately assessing a poorly functioning AE reporting system.

CONCLUSION

There is a high frequency of various AEs occurring within two Johannesburg state Academic EDs. Reporting of AEs is low, with doctors reporting significantly less than nurses do. There is also a perception that many of these events are too minor or near-misses and therefore the need to report voluntarily is absent. Other barriers include being unaware of the reporting process and if they are, lack of time to do so. Lack of feedback on AEs that have been reported also influences further voluntary reporting.

A solution to this problem is likely HCP education around adverse events, as well as an interactive and accessible reporting system such as AIMS, which was briefly trialed in the Free State. Furthermore, HCPs, other hospital staff and even patients at all Gauteng hospitals and other national hospitals would need to be involved in data collection regarding AEs. Such data would help encourage the adoption of a user-friendly, simplified AE reporting system and inevitably better standards of care for patients. This system may need to be protocolised, compulsory and reward based in order to encourage its usage.

There is also a need for a national AE database, which incorporates both state and private hospitals to further assess incidents occurring within the healthcare system as a whole.

It is expected that AE reporting may rapidly increase as seen previously in American healthcare; however, the South African Healthcare fraternity must see this as a need to improve the health system rather than as an indicator of its failures.

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Incident Reporting Questionnaire

1. Does this hospital have an incident reporting system?

   ☐ 1 Yes

   ☐ 2 No Go to Question 11

   ☐ 3 I don't know Go to Question 11

2. Have you ever filled in an incident form?

   ☐ 1 Yes

   ☐ 2 No

3. Do you know how to locate or access the incident form?

   ☐ 1 Yes

   ☐ 2 No

   ☐ 3 I'm not quite sure

4. Have you filled in an incident form in the last month?

   ☐ 1 Yes

   ☐ 2 No

   ☐ 3 I'm not quite sure

5. Do you know what to do with the completed incident form?

   ☐ 1 Yes

   ☐ 2 No

   ☐ 3 I'm not quite sure

5. For **each** incident that you report, do you :

   ☐ 1 Use only a hospital incident form (eg. WorkCover, Accident/Incident, OH&S, Exposure to Body Fluids form

   ☐ 2 Use only the AIMS+ form

   ☐ 3 Use both a hospital incident form and AIMS+ form

   ☐ 4 Use one or the other, whichever I feel is more appropriate

   ☐ 5 Never know which form to use

7. Have you ever posted an anonymous AIMS+ form directly to the Australian Patient Safety Foundation (APSF)?

   ☐ 1 Yes

   ☐ 2 No

8. We are interested in what sort of incidents and how often various types of incidents are captured on either the AIMS+ form the hospital incident form.

Please comment on your reporting practices for the following incidents:		Never	Less than 50% of occasions	50% or more of occasions	Always	N
8.1 Patient sustained a pressure sore whilst in hospital.	How often do you report this incident?					
	How often do you think you **should** report it?					
8.2 Patient sustained an injury due to a fall in hospital.	How often do you report this incident?					
	How often do you think you **should** report it?					
8.3 Patient sustained a hospital-acquired infection eg infected wound site, phlebitis due to infected IV site.	How often do you report this incident?					
	How often do you think you **should** report it?					

		Never	Less than 50% of occasions	50% or more of occasions	Always	N/A
8.4 Patient sustained a DVT post-operatively due to inadequate prophylaxis.	How often do you report this incident?					
	How often do you think you **should** report it?					
8.5 Patient received wrong treatment or procedure.	How often do you report this incident?					
	How often do you think you **should** report it?					
8.6 Patient did not receive necessary treatment or procedure.	How often do you report this incident?					
	How often do you think you **should** report it?					
8.7 Staff made a drug error but it was not actually given (near miss).	How often do you report this incident?					
	How often do you think you **should** report it?					
8.8 Staff made a drug error where no corrective treatment was necessary.	How often do you report this incident?					
	How often do you think you **should** report it?					
8.9 Staff made a drug error resulting in corrective treatment being given.	How often do you report this incident?					
	How often do you think you **should** report it?					
8.10 Problems with equipment or machinery resulting in patient harm eg. faulty pump / bed.	How often do you report this incident?					
	How often do you think you **should** report it?					
8.11 Breach in confidentiality eg. Information given without authority.	How often do you report this incident?					
	How often do you think you **should** report it?					

We would like your opinions on the following statements. For each statement below circle a number from the scale to indicate how much you agree or disagree.

9. I <u>DON'T</u> REPORT INCIDENTS BECAUSE:	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
9.1 I am worried about disciplinary action.	1	2	3	4	5
9.2 When the ward is busy I forget to make a report.	1	2	3	4	5
9.3 I am worried about litigation.	1	2	3	4	5
9.4 The incident form takes too long to fill out and I just don't have time.	1	2	3	4	5
9.5 My co-workers may be unsupportive.	1	2	3	4	5
9.6 I don't know whose responsibility it is to make a report.	1	2	3	4	5
9.7 I don't want the case discussed in meetings.	1	2	3	4	5
9.8 I don't feel confident that the form is kept anonymous.	1	2	3	4	5
9.9 Adverse incident reporting is unlikely to lead to system changes that will improve the quality of care.	1	2	3	4	5
9.10 I don't want to get into trouble.	1	2	3	4	5
9.11 Junior staff are often blamed unfairly for adverse incidents.	1	2	3	4	5

PTO →

(CONTINUED) I DON'T REPORT INCIDENTS BECAUSE:	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
9.12 When the incident does not eventuate or a correction was made (a near miss) then I don't see any point in reporting it.	1	2	3	4	5
9.13 If I report something, I never get any feedback on what action is taken.	1	2	3	4	5
9.14 The AIMS+ form is too complicated and requires too much detail.	1	2	3	4	5
9.15 I feel that if I discuss the case with the person involved nothing else needs to be done.	1	2	3	4	5
9.16 I worry about who else is privy to the information that I disclose.	1	2	3	4	5
9.17 The incident was too trivial.	1	2	3	4	5
9.18 It's not my responsibility to report somebody else's mistakes.	1	2	3	4	5
9.19 Even if I don't give my details I'm sure that they'll track me down.	1	2	3	4	5

10 Please give any other comments / reason(s) for not reporting incidents _____

_____

_____

11 What is your gender?

- ☐ 1 Male
- ☐ 2 Female

12 What is your age?

- ☐ 1 19-29 years
- ☐ 2 30-39 years
- ☐ 3 40-49 years
- ☐ 4 50-59 years
- ☐ 5 Greater than 60 years

13. What is your profession?

- ☐ 1 Intern
- ☐ 2 Resident
- ☐ 3 Registrar
- ☐ 4 Consultant
- ☐ 5 CNM or Clinical Nurse
- ☐ 6 Registered Nurse
- ☐ 7 Enrolled Nurse
- ☐ 8 Pharmacist
- ☐ 9 Dietician
- ☐ 10 Other (please specify) _____

14. How many years post entry-level qualification have you spent in the acute health sector?

- ☐ 1 Less than 1 yr
- ☐ 2 1–3 years
- ☐ 3 4-5 years
- ☐ 4 6-10 years
- ☐ 5 Greater than 10 years

Thank you very much for sparing us your time.

_____

HOSPITAL SURVEY ON ADVERSE EVENTS

THIS SURVEY WILL ASSESS YOUR HOSPITAL EXPERIENCES REGARDING ADVERSE EVENTS AND WILL TAKE 15 MINUTES TO COMPLETE.

PLEASE MARK THE APPROPRIATE BOX.

Adverse event: "An incident that results in harm to a patient that is related to medical management, in contrast to disease complications or underlying disease. Medical management includes all aspects of care from interaction with health care provider to discharge of a patient from medical treatment or health care facility"

1. What is your gender? male ☐ female ☐

2. What is your profession?

Intern ☐ CSMO Community Service ☐ MO Med Officer ☐ Registrar ☐ Consultant ☐

Prof. nurse (PN) ☐ Staff nurse (SN) ☐ Enrolled nursing assistant (ENA) ☐ Other ☐

3. How many years of experience post qualification? _____years

	No	Yes
4. Have you experienced any adverse events while working in the emergency department?		
5. Have you ever completed an adverse event (incident report) form?		
6. Where would you locate/access such an adverse event form?		
7. What should you do with a completed adverse event form?		
8. What are the changes in the new adverse event-reporting document released in 2016 by the DOH?		

9. Please comment on your reporting practices for the following incidents in the **last year (≤ 12 months)**?		Please answer by placing a *mark* **(X)** across the correct value/statement				
Patient injury due to fall in the Emergency Department (ED)	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
Missing equipment	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
Equipment fault resulting in patient harm	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
Incorrect drug given	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
Incorrect drug dose given	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
Medicine not available	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
Acute blood transfusion reactions	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report? (tick)	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable

	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
Patient did not receive necessary treatment	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
Procedure performed without verbal /written consent	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
Pressure sores acquired while in ED	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
Maternal death	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
No ward bed available after admission	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
Understaffing	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
Healthcare provider is verbally/physically assaulted *by a patient*	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse
Healthcare provider is verbally/physically assaulted *by another staff member*	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse

Absconded patient	How many times have you seen this incident?	0	1-5	5-10	10-20	>20
	How often have you/other HCP involved, filled in an incident report?	Never	< 50% of the time	≥ 50% of the time	Always	Not applicable
	How would *you* classify this adverse event?	Extreme major	Major	Minor	Very minor	Not adverse

10. How many adverse events have you *formally* (in writing) reported in the last year (12 months)?

0		1-5		6-10		11-15		>15	

11. I don't report any/all incidents because of:	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Fear of retaliation at work (I am afraid I will get into trouble)					
Lack of time					
I don't see the point					
No feedback is given after the event					
I am unaware of the reporting process					
I don't feel confident that the form is kept anonymous					
The incident form takes too long to fill out					
The incident was too trivial/minor					
Fear of litigation (I am afraid to get sued)					
Not my responsibility					
Other reasons =					

APPENDIX 3

1. INTRODUCTION

Most professions, not excluding the medical community, strive for perfection. However unfortunate though - to err is human, which may result in significant adverse events (20).

During the 1970s the aviation industry was fraught with accidents, akin to medicine. It was believed that with improved technology, skills and knowledge the rate of adverse flying events would decrease (21). This was refuted and left to the development of effective aeronautical adverse event reporting systems, which when applied to healthcare have shown to "yield previously unknown, safety-critical information for developing advances in patient safety (17).

In 1999 Kohn *et al* further emphasized that basic patient safety in healthcare was lacking and that systems should be designed to make "it hard for people to do the wrong thing and easy for people to do the right thing" (1).

During 1984 the incidence of adverse events in New York State hospitals was reported to be 3.7 %, although this number relied on the accuracy of the hospital records reviewed (4). More recent data has shown an increased incidence of adverse events to 13.5% (2). Paradoxically, this increased incidence of adverse events may be the result of better documentation rather than an effect of poorer patient safety.

When errors do occur, incident reporting is rare, even in hospitals where error reporting systems are available (22). Nurses tend to report more adverse events than any other healthcare provider (HCP) (7). Error reporting amongst doctors is notoriously low, with senior doctors less likely to complete adverse event forms (8). Reported barriers to reporting include limited time, fear of reprisal, no clear outcome thereafter and lack of feedback (22).

In the emergency department (ED), particularly, the risk of adverse events may be higher (6). Reasons for increased risk include patient factors: complex case presentations, severity of illness and increased patient load; and factors related to HCPs: limited time per patient, lack of sleep, multiple and recurrent interruptions as well as different grades of experience (6).

Errors in the ED are multifactorial and occur at different phases of the patient's ED visit from triage, examination and intervention to admission, discharge and/or handover (7). Of the total number of incidents, 56.3% adversely affected patients in the ED, ranging from prolonged waiting time to more serious mental or physical injury. Fortunately only a few adverse events had dire consequences for the patient (7). The errors occurring within South African academic hospitals EDs are not adequately reported (3).

According to the South African National Department of Health (NDOH) there are currently no published data regarding adverse events within the public setting (3). This is despite regular data collection by the South African National Blood Service (SANBS) and National Adverse Drug Event Monitoring Centre (NADEMC), both key constituents in adverse event reporting. In 2008 public hospitals in the Free State province, South Africa trialed an Australian computerized Advanced Incident Management System (AIMS). This system allowed for reporting, monitoring and analysis of adverse events occurring within and reported by HCPs in the government hospitals. The prevalence of moderate to serious events was estimated at 29.5 % (9).

Subsequently the NDOH reviewed provincial policies regarding Patient Safety Incidents (PSI) and the National Procedural Manual for Patient Safety Incident Reporting and Learning document was developed in 2016 (3). In addition to the current adverse event reporting forms of SANBS and NADEMC this document amalgamates the vast variations found in the categories of PSIs, their management and how PSIs should be reported (3). Awareness of the new PSI reporting form is limited and the NDOH suggests that Patient Safety Committees (PSC) address the recommendations of the NDOH regarding PSI's within health systems and their respective hospitals (3).

The aim of this study is to review reporting of adverse events by health care providers in Johannesburg academic ED's.

2. STUDY OBJECTIVES

i. To describe the incidence of adverse events in EDs

ii. To describe reporting of adverse events by healthcare providers (HCP) in terms of demographics:
    a. Age
    b. Gender
    c. Level of qualification
    d. Post qualification experience
iii. To compare doctors and nursing staff in terms of witnessing and reporting adverse events.
iv. To identify and describe possible barriers to adverse event reporting.

3. METHODS

The study design is a cross-sectional descriptive study of HCP's at Helen Joseph Hospital (HJH) and Chris Hani Baragwanath Academic Hospital (CHBAH) Emergency Departments. For the purposes of this study a Health care provider (HCP) is defined as a qualified and registered medical doctor (intern, community service medical officer (CSMO), medical officer (MO), registrar or specialist consultant); or a qualified and registered nurse (professional nurse (PN), staff nurse (SN) or enrolled nursing assistant (ENA)). Exclusion criteria include medical and nursing students and/or unregistered medical or nursing practitioners.

The site of the study is HJH and CHBAH Emergency Departments, Johannesburg, South Africa. A sample size of convenience will be used, with a population of 100 expected (50 doctors and 50 nurses). A pilot study is not required. An application for authorization will be made to the Chief Executive Officers (CEO) and ED Head of Departments (HOD) of HJH and CHBAH respectively. This application will be submitted following Wits Division of Emergency Medicine Research Assessment Group (DRAG) and Human Research Ethics Committee (HREC) approval.

Permission to make use of the original questionnaire was obtained on the 13 July 2017 via email correspondence (sue.evans@med.monash.edu.au), attached Appendix A. The questionnaire has been modified (Appendix B) as follows: to incorporate *ED* relevant adverse events; questions on page 1 regarding adverse event forms have been expanded from yes/no answers to answers encouraging descriptive explanation; and the final table has been modified to add "other" as an option to encourage further reasons for poor adverse event reporting behavior.

Data will be collected from ED doctors on consecutive weekly academic days at HJH and CHBAH ED's respectively, whereas data from nurses will be collected at daily morning (07h00) operational/handover meetings. ED HCP's will be informed of the nature of the study and informed consent will be obtained. Willing participants will be asked to complete the questionnaire. No identifying information will be captured. After the allotted time, completed questionnaires will be placed in an allocated box. The Investigator will collect the box thereafter and analyse the questionnaires.

4. DATA ANALYSIS

To meet the study objectives, the data will be analysed comparing HCP's observation and reporting of regarding adverse events. HCP's beliefs will also be analysed regarding the barriers preventing adequate adverse event reporting. For answers to questions 7-9, a "1" will be allocated to a correct answer and a "0" to an incorrect one. These will then be considered as categories. All answers to Likert scales will be collapsed into three categories for ease of analysis. All data will be captured from the questionnaires, entered onto an electronic spreadsheet (Microsoft © Excel, Microsoft® Office 2016, Microsoft ® Corporation), and thereafter analysed statistically.

To meet the study objectives, the data will be described using ratios and percentages for categorical data and medians and ranges or means and standard deviation as appropriate for numerical data. Fisher's Exact methodology will be used for comparing doctors to nurses' experiences for all categorical data.

5. ETHICS

The Investigator will submit an application to the Human Research Ethics Committee (HREC) by 7 October 2017. In the unlikely event that an individual participant is identified, there will be no consequence, as no current mandatory protocol regarding adverse event and/or error reporting exists.

6. FUNDING

The study will be funded by the Investigator with a predicted budget of R415:

Description	Each	Total
Photocopies	R0.50	
Protocol Submission to HREC		R115
Consent forms		R50
Questionnaires		R200
Stationery for consent forms completion		R50

7. TIMING

	02/17	03/17	04/17	05/17	06/17	07/17	08/17	09/17	10/17	11/17	12/17
Literature review											
Preparing protocol											
Protocol assessment											
Protocol assessment post corrections											
Ethics Application											
Data Collection											
Data Analysis											
Paper write up											
Submission											

8. LIMITATIONS

Possible limitations include a small sample size due to convenience sampling and incomplete questionnaires.

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APPENDIX 4

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

R14/49 Dr Dr M Zoghby

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M171119

NAME: (Principal Investigator)	Dr Dr M Zoghby
DEPARTMENT:	School of Clinical Medicine Department of Medicine Division of Emergency Medicine Thelle Mogoerane Regional Hospital
PROJECT TITLE:	The reporting of adverse events in Johannesburg academic Emergency Departments
DATE CONSIDERED:	24/11/2017
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Dr D Hoffman
APPROVED BY:	Professor CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	11/04/2018

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on 3rd floor, Phillip V Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.

I/We fully understand the conditions under which I am/we are authorised to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to resubmit to the Committee. I agree to submit a yearly progress report. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in November and will therefore be due in the month of November each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

11/04/2018
Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX 5

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ORIGINALITY REPORT

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SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.idealclinic.org.za Internet Source	3%
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Section	Original	Correction
Internal Moderator		
Pg1, Ln1	1990	1999
Pg1, para4, Sentence 2	Therefore, there is also no data concerning AEs occurring within South African hospital EDs and reporting thereof	There is also no **formal** data concerning AEs occurring within South African hospital EDs and reporting thereof. **Reporting systems and AE reporting within the smaller private healthcare sector may be more structured, however limited data is available for public scrutiny.**
Pg1, para 4	This study serves to highlight the frequency and reporting of AEs occurring within Johannesburg EDs according to the demographics of HCPs.	This study serves to highlight the frequency and reporting of AEs occurring within two **state sector Johannesburg EDs** according to the demographics of HCPs
Pg1, para 5	This questionnaire was adjusted for the South African ED setting (appendix 2 using the National Procedural Manual for Patient Safety Incident Reporting and Learning (3).	This questionnaire was adjusted for the South African ED setting (appendix 2) to incorporate *ED* relevant AEs using the National Procedural Manual for Patient Safety Incident Reporting and Learning (3). Certain questions have been expanded from yes/no answers to answers encouraging descriptive explanation and the final table has been modified to add "other" as an option to encourage further reasons for poor adverse event reporting behavior.
Pg2, Para 1	All eligible HCPs were approached where after willing participants completed the questionnaire.	All eligible and willing HCPs completed the questionnaire.
Pg 2, para 3	Similar adverse events were grouped according to the National Procedural Manual for Patient Safety Incident Reporting and Learning (3) as below:	The National Procedural Manual for Patient Safety Incident Reporting and Learning was compiled during 2016 with the primary purpose of improving awareness and reporting process of AEs as well as the steps to follow after an AE has been occured (3). Similar adverse events are grouped according to the

		National Procedural Manual for Patient Safety Incident Reporting and Learning (3) as below:
Pg 3, para 1	The completion rate on the questionnaire was 90%.	There was 10% data missing due to partially completed questionnaires and results were adjusted accordingly.
Pg 3	Graph 1. Percentage of Healtchare Providers experiencing at least ten Adverse Event per category	Figure 1. Comparison of Healthcare providers experiencing at least 1 or 10 adverse events per category
Pg3	**The need to bolster and tease out data (int & ext examiner)** When looking at different AEs, at least 24% across all categories were deemed by HCPs to be 'minor', 'very minor' or 'not adverse'.	**There is large number of AEs experienced in all AE groups, however once a minimum of 10 AEs experienced was analysed, a clearer pattern emerged of the commonest AEs experienced by HCPs in the ED.** **A portion of the questionnaire determined perceptions of HCPs towards the AEs they experienced and at least 24% across all AEs categories was deemed by HCPs to be 'minor', 'very minor' or 'not adverse'.**
Page 5, Para 1	Barriers to AEs of 'no feedback was given', 'lack of time' and 'being unaware of the reporting processes' were the most common.	The commonest barriers to AE reporting are 'no feedback was given', 'lack of time' and 'being unaware of the reporting processes.'
Page 5, Line 1, Discussion	AE incidence data within South Africa is poorly researched but is expected to be elevated and more prevalent being a Low Middle Income Country (LMIC) (9,10)	AE incidence data within South Africa is poorly researched but is expected to be elevated and more prevalent being a Low Middle Income Country (LMIC) **with fewer resources and a higher patient to doctor ratio** (9,10)
Page 5, line 2, discussion	In the latest South African Health Review 2017 there is	In the latest South African Health Review 2017 there is no data regarding

	no data regarding the incidence of **all** AEs occurring within the Department of Health, although it does look at drug AEs (10)	the incidence of AEs occurring within the Department of Health, although it does look at drug AEs (10)
Page 5, line 3, discussion	During 2008, Free State government hospitals reported nearly 400 incidents shortly after introducing a new reporting system of which 29.5% were deemed serious (9)	During 2008, Free State government hospitals reported nearly 400 incidents shortly after introducing a new reporting system of which 29.5% were deemed serious, **however the proportion which originated from the ED is unknown** (9)
Page 5, last line, discussion	Abrupt end to sentence and out of place. So removed and adjusted in next paragraph.	So removed and adjusted in next paragraph.
Page 5, para 2	The top three AEs experienced in Johannesburg EDs, play a large role in the quality of healthcare delivered within the ED and the hospital as a whole. HCP shortages suggests South Africa is struggling to meet the third Sustainable Development Goal of increasing 'health financing and the recruitment, development, training and retention of the health workforce in developing countries'(11). Resource AEs (lack of admission beds and HCP shortages), together with 'medicine' and 'medical equipment', depicts a dire situation of resource constraints in Johannesburg EDs.	**Within two of Johannesburg (JHB) state EDs, we demonstrated numerous AEs experienced by HCPs in a 12-month period**. The top three AEs experienced in **these two EDs, namely resource-related AEs (lack of admission beds and HCP shortages), together with 'medicine' and 'medical equipment', play a pivotal role in the quality of healthcare delivered within the ED and the hospital as a whole**. **A shortage of HCPs suggests** South Africa is struggling to meet the third Sustainable Development Goal of increasing 'health financing and the recruitment, development, training and retention of the health workforce in developing countries'(11).
Page 6, Para 1	EDs in the Netherlands demonstrated a different hierarchy of AEs	**Compared to the two JHB EDs**, EDs in the Netherlands demonstrated a different hierarchy of AEs

	experienced, namely 'collaboration with other departments'(24.5%), 'materials and equipment'(20.3%), 'collaboration with resident physicians & consultants'(17%) and 'diagnosis and treatment'(14.4%) (7). Within the Netherland EDs AEs related to medication amounted to a much lower 7.3% in comparison (7). Direct comparison between the two studies is difficult due to different study designs; however, one can attain perspective as to the difference between first and third world ED AEs.	experienced, namely 'collaboration with other departments'(24.5%), 'materials and equipment'(20.3%), 'collaboration with resident physicians & consultants'(17%) and 'diagnosis and treatment'(14.4%) (7). Within **the Dutch** EDs AEs related to medication amounted to a much lower 7.3% (7). **This contrast in AE hierarchies highlights the different healthcare concerns experienced in low middle and high income countries**
Page 6, Para 2	Almost a quarter of AEs experienced by HCPs were deemed as' minor', 'very minor' or 'not adverse'. This may be a major barrier to reporting (12)(13). Catherine et al. (12) elaborates that HCPs are poor at predicting outcomes of medical events and that a time interval may be necessary to ascertain whether an event was harmful or not. When HCPs define an AE as harmless, they 'justify avoiding disclosure'(12). HCPs need to start recognising these 'minor' or 'non-adverse' incidents as errors and reporting them. In doing so we will improve patient care by preventing further and maybe more harmful events occurring in the future(14).	**There are may be numerous AEs unreported in JHB EDs possibly because a quarter of AEs experienced** were deemed as' minor', 'very minor' or 'not adverse'. This may be a major barrier to reporting (12)(13). Catherine et al. (12) elaborates that HCPs are poor at predicting outcomes of medical events and that a time interval may be necessary to ascertain whether an event was harmful or not. When HCPs define an AE as harmless, they 'justify avoiding disclosure'(12). **When HCPs begin recognising these near-miss or potentially harmful incidents as errors and reporting them, we will improve patient care by preventing further and maybe more harmful events occurring in the future**(14).
Page 6, Para 3	All HCPs working in the ED experienced at least 10 AEs,	All HCPs working in the ED experienced at least 10 AEs, however

	however doctors' AE reporting rates are in keeping with their poor AE reporting practices (14–16). A large percentage of doctors formally reported no AEs in a twelve-month period, which is similar to Evans et al., where 40% of registrars and consultants had never reported a single AE (8). Harper et al. proposed that doctors report fewer AEs due to a belief that AEs are an administrative process which falls under the responsibility of the nurse attending to the patient (17). Doctors are also unwilling to admit to mistakes outside of the theoretical situation and thereby reporting an AE possibly signifies weakness (14). Conversely many doctors may have limited AE education while training and therefore when working as a qualified HCP may be unaware of what or how to report an AE (18).	doctors' AE reporting rates are in keeping with poor AE reporting practices **globally** (14–16). **Within a twelve-month period in JHB EDs, 57% of doctors reported no AEs**. This is similar to Evans et al., where 40% of registrars and consultants **from South Australian hospitals in a variety of clinical areas, including ED,** had never reported a single AE (8). Harper et al. proposed that doctors report fewer AEs due to a belief that AEs are an administrative process which falls under the responsibility of the nurse attending to the patient (17). Doctors are also unwilling to admit to mistakes outside of the theoretical situation and thereby reporting an AE possibly signifies weakness (14). Conversely many doctors may have limited AE education while training and therefore when working as a qualified HCP may be unaware of what or how to report an AE (18). **The other part of the problem includes lack of support for HCPs working within the hospital system, where strong management input around processes and policies would help support its HCPs in the clinical setting.**
Page 6, para 4	This may be as seasoned HCPs who experience regular AEs, within a dysfunctional system, may develop a blasé attitude towards the reporting of AEs, especially those where no obvious harm has occurred; recently qualified HCPs are more likely to follow the relevant steps after an AE has occurred. There are no previous studies comparing reporting practices of male and female HCPs and this study showed no difference. In a healthcare system with clear, consistent guidelines as	This may be as seasoned HCPs who experience regular AEs, within a dysfunctional system, may develop a blasé attitude towards the reporting of AEs, especially those where no obvious harm has occurred. Recently qualified HCPs are more likely to follow the relevant steps after an AE has occurred, **however fear of retaliation or lack of anonymity as found in JHB EDs may hinder this process**. There are no previous studies comparing reporting practices of male and female HCPs and this JHB ED study showed no difference. In a healthcare system with clear, consistent guidelines around AE reporting as well as an easy to use,

	well as an easy to use reporting system, demographic factors affecting AE reporting could be more easily explored and differences found.	**mandatory** reporting system, demographic factors affecting AE reporting could be more easily explored and differences found
Page 6, Para 5	Harper et al. (17) noted that over 80% of HCPs would be more likely to voluntarily report AEs if there was feedback given, on correct measures taken to prevent further AEs occurring.	Harper et al. (17) noted that over 80% of HCPs would be more likely to voluntarily report AEs if they were given feedback about strategies and effective changes in their ED to help prevent further AEs from occurring.
Page 7, line 2	In this study, undertaken over 1 year at CHBAH and HJH, over 10 000 AEs have been experienced by 100 HCPs in the ED alone.	In this **JHB ED study**, undertaken over 1 year at CHBAH and HJH, over 10 000 AEs have been experienced by 100 HCPs in the ED alone
Limitations	This was a small study of only 100 participants, all of which were HCPs at two Johannesburg hospitals. In order to gain better perspective of the problem at hand, further HCPs, other hospital staff and even patients at all Gauteng hospitals would need to be involved in data collection regarding AEs	This was a small study of only 100 participants, all of which were HCPs at two **Johannesburg state academic hospitals. Questionnaires were self-administered**. **There is limited data from the two JHB state EDs regarding AEs and therefore this JHB ED study is ultimately assessing a poorly functioning AE reporting system.**
Recommendations		In order to gain better perspective of the problem at hand, further HCPs, other hospital staff and even patients at all Gauteng hospitals would need to be involved in data collection regarding AEs. There is a need for implementation of a national AE database which incorporates both state and private hospitals to further assess incidents occurring within the healthcare system. With this data effective policy changes can occur and the safety of patients improved.

Conclusion	There is a high frequency of various AEs occurring within Johannesburg Academic EDs. **The greatest AE experienced is resource allocation, which includes overburdened bed occupancy rates as well as understaffing**. Reporting of AEs is low, with doctors reporting significantly less than nurses do. There is also a perception that many of these events are too minor and therefore the need to report voluntarily is absent. Other barriers include being unaware of the reporting process and if they are, lack of time to do so. Lack of feedback on AEs that have been reported also influences further voluntary reporting. A solution to this problem is likely HCP education around adverse events, as well as an interactive and accessible reporting system such as AIMS, which was briefly trialed in the Free State. It is expected that AE reporting may rapidly increase as seen previously in American healthcare; however, the South African Healthcare fraternity must see this as a need to improve the health system rather than as an indicator of its failures. Future research is needed to demonstrate the exact levels of AEs occurring elsewhere within Gauteng and other national hospitals. Such data would help encourage the adoption of a user-friendly, simplified AE reporting	There is a high frequency of various AEs occurring within two Johannesburg state Academic EDs. Reporting of AEs is low, with doctors reporting significantly less than nurses do. There is also a perception that many of these events are too minor or **near-misses** and therefore the need to report voluntarily is absent. Other barriers include being unaware of the reporting process and if they are, lack of time to do so. Lack of feedback on AEs that have been reported also influences further voluntary reporting. A solution to this problem is likely HCP education around adverse events, as well as an interactive and accessible reporting system such as AIMS, which was briefly trialed in the Free State. **Furthermore HCPs, other hospital staff and even patients at all Gauteng hospitals and other national hospitals would need to be involved in data collection regarding AEs. Such data would help encourage the adoption of a user-friendly, simplified AE reporting system and inevitably better standards of care for patients. This system may need to be protocolised, compulsory and reward based in order to encourage its usage.** **There is also a need for a national AE database which incorporates both state and private hospitals to further assess incidents occurring within the healthcare system.** **It is expected that AE reporting may rapidly increase as seen previously in American healthcare; however, the South African Healthcare fraternity must see this as a need to improve the health system rather than as an indicator of its failures.**

	system and inevitably better standards of care for patients. This system may need to be protocolised, compulsory or reward based in order to encourage its usage.	
External Moderator		
Abstract	100 There is low levels	One hundred There are low levels
Graphs Page 6 Page 7, limitations Data collection 90 % completion rate Other issues addressed with internal examiner comments	 Catherine et al. This was a small study of only 100 participants, all of which were HCPs at two Johannesburg state academic hospitals. Data was collated using the online data management service REDCap©. Raw data was thereafter exported and analysed in Microsoft Excel 2016 and statistical analysis performed using IBM SPSS Statistics 25©. Adjusted with internal moderator comments	Names changed from graphs to figures Chamberlain et al This was a small study of only 100 participants, all **of whom** were HCPs at two Johannesburg state academic hospitals. Study data was collected and managed using REDCap (Vanderbilt University, USA) electronic data capture tools hosted at Witwatersrand University. Raw data was thereafter exported and analysed in Excel 2016 (Microsoft, USA) and statistical analysis performed using SPSS Statistics 25 (IBM, USA).