

**Barriers and perceptions to
medication administration error
reporting among nurses in Saudi
Arabia**

by

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Abstract

Background: Medication administration errors (MAEs) are considered as a global problem which influences the safety of patients. Due to some factors MAEs are still underreported. However, MAEs have been under-researched in Saudi health settings. The reporting barriers of fear, perception of nurses towards reporting MAEs, and the process of reporting significantly contribute to failure to report. Understanding of factors that may inhibit reporting MAEs among nurses in Saudi Arabia is a primary step to improve the safety culture of hospitals. Furthermore, understanding nurses' perception toward MAEs reporting is the initial step to increasing the reporting rate.

Aims: (1) To identify factors from the literature that facilitate or hinder the reporting of medication administration errors among nurses and (2) to identify factors that nurses perceive as major contributors in the culture of reporting medication administration errors in Saudi Arabia hospitals.

Methods: a questionnaire was developed consisting of four pages to examine the nurses' perceptions and the potential barriers to the reporting of medication administration errors and an open-ended question to seek more understanding of this topic among nurses in Saudi Arabia. The questionnaire items included: demographics and background, nurses' perceptions of reporting medication administration errors and potential barriers to reporting MAEs. Participants for this study were nurses from three hospitals in Saudi Arabia. The Statistical Package for the Social Sciences Software the IBM (SPSS) Statistics was used to analyses the quantitative data and content analysis was used to analyses the qualitative data.

Results: A total of 366 nurses participated in the study with response rate 63.3%. Nurses' perception and awareness towards the importance of medication administration error reporting were positive. The major perceived barrier was fear of the consequences after reporting. This study found only 28.6% of nurses always reported MAEs when it occurs. Nursing administration (Head Nurse, Nursing Supervisor and/or Nursing Director) was the biggest concern affecting nurses' willingness to report MAEs. Making the work environment, a non-blame environment may encourage a greater reporting of MAEs.

Conclusions: Most nurses in Saudi Arabia's hospitals believed that MAEs must be reported. However, fear of blame or the possibility of legal action and administration factors lead to underreporting.

Implications for nursing management: Nursing administration should work towards establishing a blame free culture and support the safety culture to encourage reporting.

Key words: reporting barriers, medication administration errors, nurse, safety, reporting, report incident, culture of blame.

CHAPTER 1: INTRODUCTION

1.1 Introduction

This chapter introduces the study by covering the main points including the context of the study, research problem, research question, purpose, aims, objectives and study significance. The key terms used in the study are defined in this chapter. Finally, the chapter concludes by providing a succinct summary of all information provided.

1.2 Context of the study

The Kingdom of Saudi Arabia is divided into five sectors (states) i.e. Northern, Southern, Eastern, Western and Middle sectors (Algahtani 2015). Most of the Saudi population is located in three of the five regions in the country, Middle, Western and Eastern sector (Algahtani 2015). This is no surprise given that the Western region is the religious capital of Islam of the world. The Middle region is the center of the administrative capital and most of governmental organizations. Eastern region is the largest oil exporter and the second largest oil reservoir in the world (The Organization of the Petroleum Exporting Countries (OPEC), 2014). A significant number of oil companies are established there with many international oil experts employed.. As a result, great numbers of people migrate into these three regions to work or study. Accordingly, people from these three regions have long been influenced by constant exposure to visitors, experts, professionals and pilgrims from all over the world. Moreover, many of hospitals in these regions have been accredited by Joint Commission International (JCI), which helps in improving the culture of safety in the health systems in these regions.

The South region which also called (Asir region), where this study was conducted, is located in the southern part of the Kingdom of Saudi Arabia, and it is the third largest region in the country. In Asir region, there are 19 public hospitals, 20 private hospitals and about 250 primary health care centers (PHCs) (Al-Saeed 2007). The General Directorate of Health Affairs in Asir manages these health care organizations under the Ministry of Health (MOH) authority. The Saudi government provides all Saudi citizens with free health care services (Alkolibi 2002). The Saudi health care system can be categorized as a national health care system in which the government is responsible of providing health care services through a

number of public and private hospitals and primary health care centers (PHCs). The Saudi Ministry of Health is considered the government agency entrusted with providing preventive, curative, and rehabilitative health care for all citizens (Memish et al. 2014).

This region was chosen for this study as it is an isolated community. People from this region rarely contact anybody other than people from their tribe or neighboring tribes, resulting in more conservative cultures (Searle & Gallagher, 1983; Vogel, 2000). There is lack of research into the area of the quality and safety of health care hence this region lags behind in terms of safety culture and quality of care.

1.3 Background

Medication administration errors (MAEs), constitutes a serious threat to patient safety that leads to an increased rate of morbidity and mortality (Aronson 2009). It has been estimated that medication administration errors cause the deaths of 7,000 patients annually in the United States alone (Holmström, Laaksonen & Airaksinen 2015). Medication administration errors can occur during various stages of the medication process such as, prescribing stage, dispensing stage, administration stage and transcribing stage. When medication administration errors occur, nurses always face blame, because they administer the vast majority of the medications ordered in hospitals (Chiang, & Pepper 2006).

Reporting medication administration errors can help identify potential harm and risk, and provide information to identify and rectify defective systems. The identification and reporting of medication administration error data provides clinicians, managers, and researchers with opportunities to examine medication administration processes to influence future practice with a view to minimize likelihood of MAE (Hession-Laband & Mantell 2011). An organizational culture that promotes the reporting of MAE is closely linked to patient safety (Paiva et al. 2014). Preventing medication administration errors is linked to the accurate reporting of these errors (Mayo & Duncan 2004). Thus, fostering a culture in which nurses are empowered to detect, report and challenge unsafe practices, including unsafe medication administration, is fundamental to improve safe practice (Andrew & Mansour 2014).

Great number of studies' findings found that factors such as culture, the reporting systems, the management and demographic variables could influence nurse's MAEs (Chiang, H-Y et al. 2010; Mayo & Duncan 2004; Walters 1992). The Agency for Health Care Research and Quality [AHRQ] (2014) states that an organization's culture toward safety can have a critical influence on the workplace health and safety practices such as adherence to safety practices

such as administering medications and reporting their error when they occur. Thus, making the health organization's culture a culture that supports reporting of errors is important to enhance patient safety and quality of care (Blignaut, Coetzee & Klopper 2014). A health organization is considered as having a safety culture when all health practitioners, regardless of their position or specialty, play an active role in error prevention and that role is supported by the organization (Zhang et al. 2002).

Medication administration error reporting provides data that can be used to improve patient quality of care and safety. If there was no MAEs reporting data, health organizations would be less able to identify the causes and prevent the same problems from recurring (Uribe et al. 2002). In Saudi Arabia, however, researchers have paid little attention to the MAE reporting barriers among nurses (Chiang, HY & Pepper 2006). Although many studies have addressed medication administration errors, few have investigated the relationship between medication administration errors and nurses' characteristics as well as the predictors of medication administration errors (Mrayyan, Shishani & Al-Faouri 2007).

The health-care system in Saudi Arabia is continuously undergoing major improvement programs to ensure the safety and quality of care (Zakari, al Khamis & Hamadi 2010). These changes will influence the nature of health-care practice in terms of quantity and quality such as, reporting medication administration errors (Almalki, FitzGerald & Clark 2011). As a result, this issue requires close attention of health researchers. According to Alghamdi & Urden (2016), there is lack of a national benchmarking database for nursing quality indicators (including the rate of MAE reporting) in Saudi Arabia's health system. Moreover, there is no accurate data about managing risk to the patient and the health system, such as MAEs, which may indicate deficiencies in the health care system (Almutary & Lewis 2012). These issues can create challenges for a health facility endeavoring to adopt quality and safety standards of nursing practice in the context of Saudi Arabia (Alghamdi & Urden 2016).

1.4 Research problem

Nurses are closely involved in the medication administration errors process, because they administer the vast majority of the medications ordered in hospitals (Chiang, HY & Pepper 2006). Although, many health organizations have error reporting systems in place, the under reporting of medication administration errors is a significant issue among nurses (Gonzales 2010). However, Board of Nurse Examiners (2001) (cited in Mrayyan, Shishani and Al-

Faouri 2007) suggested that to encourage nurses to report their MAEs, health care culture required redesign rather than continuing the current traditional culture in which individuals are punished and seen as the cause of medication administration errors. Such a punitive system is more dominant in developing countries such as Saudi Arabia.

Alsawedan (2007) claimed that during the years 2001-2006 medical errors including MAEs in Saudi Arabia reached approximately 26,000 errors. Moreover, the main conclusion of International Maritime Organisation (IMO) report about “Keeping Patient Safe” (2004) was that there is a slow improvement of patient safety due to the lacking of research on organizational dimensions of health care environments.

Examining the potential barriers of reporting MAEs among nurses in Saudi Arabia in the existing health culture will help in providing a description of the current status of patient safety and the nurses’ willingness to report MAEs. Moreover, development of a deeper understanding of nurses’ perceptions toward MAEs reporting will also help in raising the awareness throughout the various health care organizations and identify areas that need interventions for improvement. Therefore, data and details about errors must be available to improve safety, and minimize or eliminate MAEs.

1.5 Aim and objectives of the study

The overall aim of this study is to identify potential barriers or challenges that may influence reporting of medication administration errors among nurses in Saudi Arabia. This aim was achieved by accomplishing the following objectives:

- To identify factors from the literature that facilitate or hinder the reporting of medication administration errors among nurses.
- To identify factors that nurses perceive as major contributors to a culture of reporting medication administration errors in Saudi Arabia hospitals.

1.6 Research questions

The main research question in this study is: what are the barriers to the reporting of medication administration errors among nurses in Saudi Arabia?

The secondary research questions are:

- Is there significant difference in nurses’ perception to report medication administration error/s among the demographic attributes of gender, age,

ethnicity, level of education, years of post-graduate nursing experience and working area of hospital?

- Is there significant difference in nurses' perceptions of personal, administrative and reporting process factors as potential barriers to report medication administration error/s among the demographic attributes of gender, age, ethnicity, level of education, years of post-graduate nursing experience and working area of hospital?
- What are nurses' suggestions that help in motivating nurses to report medication administration errors?

1.7 Significance of the study

There is significant evidence that increased reporting of errors including MAEs can lead to improved outcomes for patients. There is a correlation between error reporting culture and safety performance (Hutchinson et al. 2009). Another study of medication administration error reporting found that reports were used to enhance the communication process, and change policies which then leads to improve safety (Pham et al. 2011). The culture of reporting is important to detect medication administration errors. Recording medication administration errors will help the managers and policymakers to gain more information and knowledge about the safety of the system as a whole in this organization (Kagan & Barnoy 2013).

In Saudi Arabia, however, a study's results highlight that safety culture in health care settings need to be fully developed, as there are several areas for improvement including error reporting, response to errors, and administration and leadership factors (Alahmadi 2010). Moreover, the health care system in Saudi Arabia lacks a national benchmarking database for nursing quality indicators including the rate of MAE reporting (Alghamdi & Urden 2016). There are no accurate data in Saudi Arabia health care system about safety problems, such as MAEs, which may identify potential deficiencies in the health care system (Almutary & Lewis 2012). These issues can create challenges for a health facility endeavoring to adopt quality and safety standards for nursing practice in Saudi Arabia (Alghamdi & Urden 2016). Thus, the Saudi Government particularly the Ministry of Health have been actively working hard to improve the safety and the quality of care that provided by healthcare services (Alahmadi 2010). Recently, the Saudi Ministry of Health implemented a compulsory national

accreditation program to strengthen patient safety, improve safety culture, manage medical errors, and develop a robust error reporting system.

The results of this study can assist in identifying the reasons why MAEs are or are not reported, what factors influence this, what factors nurses in Saudi Arabia hospitals consider when deciding to report MAEs or other barriers. These issues will then help in providing new knowledge and valuable understanding of safety culture, work environment, and MAE reporting practice, to assist healthcare leaders and policy makers to build a healthcare environment focusing on patient safety and voluntary medication administration error reporting in Saudi Arabia. Moreover, the study results can be used to develop educational programs for patient safety promotion. In addition, the research instruments used in this study could be applied to similar studies in the future. Thus, research on this topic is imperative and timely.

1.8 Definition of terms

- Medication administration errors (MAEs): ‘a deviation from the prescriber’s medication order as written on the patient’s chart, manufacturers’ preparation/administration instructions or relevant institutional policies’ (Shawahna et al. 2016). Further, according to Bower, Jackson & Manning (2015) the Canadian Patient Safety Institute (2003) defines MAEs as ‘any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient, or consumer’. Both of these definitions highlight the complex nature of medication administration error incidents which may increase the errors and risk (Bower, Jackson & Manning 2015).
- Nursing administration: the term ‘nursing administration’ in this study means Head Nurse, Nursing Supervisor and/or Nursing Director.
- Head nurse: the nurse who manages most of the administrative duties in addition to provide some patient care, supervises and coordinates all ward activities.
- Nursing supervisor: one who administers, supervises and coordinates the nursing service activities within a given nursing specialty areas (an area may consist of one or more nursing units) and or coordinates and supervises all nursing activities for the entire hospital during the assigned shift.
- A Staff nurse: a registered nurse who is responsible for managing the care of patient.

- A culture of blame: a set of norms and attitudes within a particular organization characterized by an unwillingness to take risks or accepting responsibility for mistakes because of a fear of criticism or prosecution (Morrison et al. 2001).

1.9 Conclusion

This study is about the factors that may influence the reporting of medication administration error among nurses in Saudi Arabia. Reporting errors of medication administration is a very important nursing practice. Reporting medication administration errors is fundamental to the prevention of adverse events. However, because of some potential barriers that may prevent the nursing staff from reporting medication administration errors such as, nurse's perception to report medication administration error/s, administration factors and the reporting processes factors, many of medication administration errors go unreported by nurses. Recognizing such factors will help in encouraging nurses to report MAE's.

The chapters of this document are organized as follows:

Chapter 1, the Introduction presents the background of the research, research aim, research questions, significance and the definition of terms.

Chapter 2, the Literature Review provides a synopsis of existing knowledge in the field of study. The sub-headings are safety culture, culture of blame and process of reporting MAEs.

Chapter 3, the Research Methods and Methodology, provides information on the research methods (tools and techniques) and methodology (justification of the methods) of the thesis. It gives information describing how the research was conducted to achieve the objectives and aims that been stated in Chapter 1.

Chapter 4, Results, presents the results of data analysis and findings of the current study. This chapter starts with the response rate for return of the questionnaire. Then the findings are presented in three parts. The first part contains all demographics and background of the participants such as; gender, age, ethnicity, education, years of post-graduate nursing experience, are of working, job position, the frequency of reporting MAEs, and the way used to report MAEs. The second part contains the nurses' perceptions of reporting MAEs. The third part consists of the three potential barriers to reporting MAEs which are; the personal factors, the administration factors, and the reporting process factors.

Chapter 5, Discussion, is guided by the study questions and aims. It will integrate and discuss the findings of both quantitative and qualitative analysis.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter discusses MAE in general. Specifically, this chapter examines the following issues: Definition of medication administration errors, safety culture, culture of blame and the process of reporting MAEs and Summary.

This section aims to identify and review the literature pertaining to MAEs reporting. Due to the limited literature on the barriers to the reporting of MAEs among nurses in the Saudi context, literature from different countries and across all hospital settings (mental health care, general wards and critical care units) was reviewed. The countries include Taiwan (Chiang, H-Y et al. 2010), Jordan (Mrayyan, Shishani & Al-Faouri 2007 and Iran (Hajibabae et al. 2014). The resources utilized in this literature included books, a research thesis, and papers identified through online search strategies of search engines. The major scientific databases that the author searched include, but are not limited to, Google Scholar, CINAHL (Cumulative Nursing and Allied Health Literature), PubMed and Scopus. The literature searches for each concept began by identifying various relevant terms (e.g. medication administration error, safety culture, culture of blame, reporting, reporting process and barriers). As well as these terms, the examination included searches under variant appropriate abbreviations, synonyms, related terms, alternative spellings (American, British, misspellings) and narrower terms in the same topic. Several themes were identified from this review.

2.2 Safety culture

In health care organizations, the work environment and culture are considered crucial to patient safety (Alahmadi 2010). Worldwide, due to MAEs or adverse events, it is estimated that 1 in every 300 patients are harmed during their hospitalization (World Health Organization 2012). Professionally and ethically, nurses are responsible for acting in the best interests of the patients in their care and for protecting the patients. This care includes administering drugs in a safe way (Griffith 2015). Thus, as Saleh, Darawad and Al-Hussami (2015) suggest, the need to create and maintain a culture of safety within all healthcare organizations is highly recommended by The Institute of Medicine to transform the nursing work environment in order to promote the health and safety culture.

In order to create a culture of safety for the patient, many factors must be present such as, environmental safety, environmental security, positive culture, supportive leadership, and open communication about medication administration errors (Joint Commission Resources 2007). The identification and reporting of safety events are essential components of an effective safety culture (Hession-Laband & Mantell 2011). A positive organizational culture that promotes patient safety is closely linked to the reduced errors that the health care staff make (Paiva et al. 2014). It is known that the workplace environments and culture of the health organization influence error reporting (Kagan & Barnoy 2013). Reporting will occur if it becomes a culturally accepted activity within the health care community (Cohen 2000).

Understanding nurses' perceived barriers to MAE reporting is a main step in strengthening medication safety. Thus, improving patient safety by fostering a culture in which nurses are empowered to detect, report and challenge unsafe practices, including unsafe medication administration, is fundamental (Andrew & Mansour 2014).

The health care system in Saudi Arabia, in response to a range of challenges such as, the increasing rate of medical errors, increasing media attention and public pressure, health organizations have implemented several interventions to improve safety culture and quality of care. However, little is known about safety culture in Saudi hospitals, and few studies and attempts have been conducted to address these issues to which safety is a strategic priority or that health culture supports and promote patient safety (Alahmadi 2010).

2.3 Culture of Blame

Traditionally, the professional culture of medicine and nursing in general is punitive and unlikely to foster the reporting of mistakes (Lawton & Parker 2002; Moutzoglou 2010). Globally, Pronovost et al. (2003) claimed that, only 32% of health organizations have an established workplace climate that supports error reporting. As a result, in such an environment the reporting of MAEs can be inhibited because of the expectation that the errors are considered as someone's fault (Waring 2005). The identification of errors inside a healthcare system is one of the most important steps to put into action and then correct them (Bellandi, Albolino & Tomassini 2007).

Health organizations rely on the ability and willingness of nurses as front-line staff to recognize and report MAEs when they occur (Mayo & Duncan 2004). Thus, it is important to create a non-punitive culture inside health organizations to address these issues (Lehman et al., 2007).

A study in Jordan hospitals, which is a culture near to Saudi Arabia culture, highlighted the presence of a blame and shame culture, and the punitive responses to errors prevented the nurses from reporting MAEs (Khater et al. 2015). As a result, silence, denial, or cover-up will be the predominant response to errors in health care organizations with a blame and shame culture (Kalra, Kalra & Baniak 2013). As a result, such a culture inhibits health workers from openly expressing their opinions and concerns about organizational problems (Yurdakul, Beşen & Erdoğan 2016). Errors and mistakes will be ignored, and no feedback is offered and thereby impairing the development and improvement of patient safety (Çınar, Karcıoğlu & Alioğulları 2013). To conclude, the culture of blame is definitely a significant barrier to reporting MAEs.

2.4 Process of Reporting MAEs

Hospital error reporting systems have been utilized since the 1960's (Hicks & Becker 2006). The basic and well known tool for the MAEs reporting system is the MAEs form or incident reporting system (Bellandi, Albolino & Tomassini 2007). However, there are limitations and criticisms that have been raised in relation to incident reporting forms/systems (Milligan 2012). A study has found that complex reporting systems and hand-written reporting forms decrease the rates of medication administration error reporting because it takes too much time for nurses to complete reports (Milligan et al. 2014).

Recently, many of efforts and approaches have been focusing on improving and simplifying error reporting forms/systems (Hughes 2008). A professional system of recording and reporting errors should facilitate the reporting of errors. It should be easy and quick to complete and be accessible to all the workers (Haw & Cahill 2011). A well-designed error reporting system, and particularly for medication administration errors, provides correct information about the reasons for the occurrence of the errors and allows changes to be made within the health care system to reduce such errors in the future (Ross, Wallace & Paton 2000). Furthermore, MAEs reporting system or forms should ensure that all nurses' data are anonymous and confidential (Kalra, Kalra & Baniak 2013). Such a system is vital not only for patient safety but also for the organization itself, as it allows for better recognition of errors and thus their prevention (Hajibabae et al. 2014).

Another important characteristic of reporting systems is providing feedback to enable expert reviewers and administrators to comment on the reported incidents (Benn et al. 2009). The implementation of the nurses' comments and recommendations would help in assuring nurses

that action is being taken in response to their error reports. Such follow-up and feedback would help in promoting the nurses' willingness to report their MAEs (Kalra, Kalra & Baniak 2013). One study found that the number of error reports increased when nurses use a reporting system that featured frequent feedback (Wolf & Hughes 2008). Thus, the actionable feedback from error reporting is recommended to promote MAEs reporting.

2.5 Conclusion

The literature identified that the health workplace atmosphere and culture are considered fundamental to patient safety. The concept of patient safety and free blame culture are now seen as central to achieving improvements in health-care quality around the world. Furthermore, MAEs reporting forms/systems are important and central to reducing error rates and improving safety and quality of care. Reporting systems need to be easy, quick to complete, anonymous, confidential and accessible to all nurses. Feedback from the reporting system and recognition of benefits from them is important to nurses.

The literature review demonstrates the need for this research and the following chapter will describe the methodology and methods used in the study.

CHAPTER 3: RESEARCH METHODS AND METHODOLOGY

3.1 Introduction

This chapter provides information on the research methods (tools and techniques) and methodology (justification of the methods) of the thesis. It gives information describing how the research was conducted to achieve the objectives and aims that been stated in chapter 1. This study aims to identify and explore the barriers to reporting medication administration errors among nurses in Saudi Arabia by identifying the perception of nurses about MAE reporting practice, the factors that may have impact in MAE reporting practice such as, nurses' personal factors, the administration factors, and the reporting process of the medication administration errors.

3.2 Study design

This study used a descriptive design combining both quantitative techniques and qualitative data, to collect and analyses data using a self-administered questionnaires (Appendix 1) (Schneider & Whitehead 2013). Questionnaires were considered a suitable choice for data collection because of the need to collect standardized data that can allow more objective analysis and statistical testing. Questionnaires also allow the study to reach a large sample of respondents hence improving the generalisability of the findings. Since the respondents are expected to be very literate professionals, it was possible to use a self-administered questionnaire which each respondent can read and respond personally without assistance. Privacy was considered essential to enhance anonymity given that the questionnaire asked respondents to respond to issues that evaluate and affect their employers' decisions.

The questionnaires were designed on a Likert scale of 1 to 5. Literature review shows that other similar studies used the same Likert scale (Almutary & Lewis 2012; Okuyama, Sasaki & Kanda 2010). Hence, it was considered suitable for this study also.

Qualitative data through interviews was also planned. The reasons behind using qualitative data were to develop a deeper understanding of the topic and to give participants an opportunity to provide more detailed information on the topic (McCusker & Gunaydin 2015). The purpose of this investigation was to examine the potential barriers to MAE reporting and work environment among nurses in Saudi Arabia. This study used a cross-sectional and correlational quantitative design with self-administered questionnaires in which the

relationship between the reporting of medication administration errors and nurse perceived reporting barriers were studied.

3.3 Setting

This study was conducted in three major public hospitals located in the Asir region of Saudi Arabia which are: Asir Central Hospital (500 beds), Khamis Mushayt General Hospital (150 beds) and Ahad Rufaidah Hospital (50 beds). A variety of services are delivered in these hospitals. They have a variety of inpatient wards including critical care units, outpatient areas and artificial kidney unit. All of these hospitals are public and funded/administered by the government. The General Directorate of Health Affairs in Asir, which is linked to the Ministry of Health, manages these three hospitals. The nursing units utilized in these three hospitals were almost similar in structure and staffing patterns.

All nurses working in patient care areas or administrators of nursing areas were included in this study. As mentioned above, due to some reasons, most of the health workforce, including nurses, are expatriates (Aboshaiqah et al. 2016). Also, most Saudi health care system nurses held undergraduate degrees in nursing whereas, only a very few nursing postgraduate degrees are available (Al Hosis 2010).

3.4 Selection of Population

The study population consisted of all nursing staff working at the three involved hospitals (Asir Central Hospital, Khamis General Hospital and Ahad Rufaidah Hospital). This study included all nurses who graduated with a diploma, associate, bachelor's degree, or postgraduate degree such as master's degree and PhD, and were still actively working in any area of the hospital.

Criteria for inclusion were:

1. All Saudi and non-Saudi nurses employed in the three involved hospitals for at least six months. Thus, the assumption was made that exposure to medication administration errors was more likely on this group of nurses who have been employed for more than 6 months.
2. Nurses with any role or title including enrolled or registered nurses.

The only exclusion criterion was of nurses who do not meet the inclusion criteria.

3.5 Recruitment Strategies

For the study to be successful and to recruit as many participants as possible, the cooperation of the Saudi Ministry of Health administration and the Directorate General of Health Affairs in Asir were critical. Thus, the researcher contacted the Institutional Review Board (IRB) committee that belongs to Saudi Ministry of Health to get an ethical approval. The General Directorate of Health Affairs in Asir region of Saudi Arabia was contacted to get a formal letter of permission to use the three premises. Then, these two letters and the evidences of the ethical approval of the study that had been approved by The Human Research Ethics Committee (HREC) at the University of Adelaide in Australia were sent to the three hospitals directors, managers of nursing and head nurses of all departments in each hospital (Appendix 2, Appendix 3, Appendix 4).

The researcher attended the monthly nursing management meeting in each involved hospital targeting nursing managers. In this meeting, the researcher provided a brief presentation as an overview about the study project, including its aim and objectives, as well as the data collection process to nursing leaders.

Furthermore, the researcher conducted brief presentations in each hospital targeting as many nurses as possible in the main auditorium providing a summary of the information about the research aims and scope to ensure that they had a clear understanding of the study and its process.

3.6 Pilot

Piloting of the data collection tool was undertaken for the following reasons. Firstly, it was undertaken to examine the clarity and understanding of the questionnaire's items and instructions. Secondly, it was used to identify any potential practical issues or problems in the distribution and collection process of the completed questionnaires. Thirdly, it was conducted to identify how much time is needed for participants to finish the survey. The researcher recruited ten nurses, seven from the target group in one of the three involved hospitals and three nurses, who were close to the same culture and setting of the actual study. The feedback from these participants showed that the questionnaire was clear, understandable and could be self-administered. They also agreed that the topic was important and significant to nursing

profession. However, some comments were considered and changes were made such as; the layout, the wording of questions, some spaces in the tables and the numbering used.

3.7 Data Gathering Instrument

The development of the right tools is important for addressing the purpose of the study and answering the research questions (Schneider & Whitehead 2013). A questionnaire is a popular tool for collecting data and often used in nursing research (Quick & Hall 2015). The questionnaire was adapted from a 27-question self-administered survey developed by Hyfa (Almutary & Lewis 2012). This instrument was originally developed by Wakefield (Wakefield et al., 1996). The questionnaire was originally designed for study that examined the nurses' willingness to report MAEs using the Medication Administration Errors Reporting Scales (Almutary & Lewis 2012).

For this study, thirty-two questions question were used. The validity and reliability of the items of this instrument have been tested in several studies (Almutary & Lewis 2012; Chiang, H-Y et al. 2010; Okuyama, Sasaki & Kanda 2010). This instrument covered the objectives and aims of this study. An open-ended question was added to collect more comments about MAEs reporting or suggestions that may help in motivating nurses to report MAEs that were not addressed in the questionnaire items. The researcher has obtained written permission from the author to use and modify this instrument for this study (Appendix 7).

This survey contains 32 questions in three general content areas or parts. The first part of the study's questionnaire contained 11 demographic and background questions developed by the researcher that asked the participants to circle the appropriate answer regarding their, gender, age, ethnicity, education, years of experience, area of work, job position, frequency of making medication administration error, and the way of reporting the errors.

The second part of the study's survey was about nurses' perceptions of reporting medication administration errors (5 items) using a five-point Likert-type scale, where responses range from 5 = strongly agree to 1 = strongly disagree. Questions in this part asked the participant to rate how each individual question contributes to reporting medication administration errors. Questions that were included are:

1. When a medication administration error occurs, I think it should be reported.
2. I believe that reporting medication administration errors is a worthy use of my time.

3. I am likely to report a medication administration error even if it did not harm the patient.
4. I am likely to report a medication administration error only when similar errors have occurred previously in the department.
5. I would report a medication administration error even if I was not involved in it (for example another nurse on your shift made a medication administration error and you know they did not report).

The third part focused on potential barriers to reporting medication administration errors using a five-point Likert-type scale, where responses range from 5 = strongly agree to 1 = strongly disagree. This part divided to three sections:

- personal factors (6 items), statements in this section included:
 1. Focus on the individual rather than the system or other external factors;
 2. Thinking other nurses will view the nurse is incompetent;
 3. Feeling he/she may be discriminated against by co-workers;
 4. The other employees in the hospital would become aware of this error;
 5. Fear of punishment, possible to face legal action; and,
 6. Patient or family may develop a negative attitude toward the nurses.
- administration factors (4 items), statements in this sections focus on potential factors that may inhibit the reporting of MAEs included:
 1. Fear of punishment by nursing administration;
 2. Nursing administration may believe that medication administration error is a measure of the quality of nursing care that nurse provided;
 3. Nursing administration would focus on the individual nurse as the primary cause of the medication administration error rather than seeing it as a system problem; and,
 4. The response by nursing administration may not match the severity of the medication administration error (i.e. a relatively simple error results in a significant punishment).
- reporting processes factors (4 items), statements in this sections focus on the reporting MAEs system included:
 1. If the reporting form is too complicated;
 2. Reporting MAEs takes too much time;
 3. Reporting MAEs is unclear; and,

4. The hospital's definition of a medication administration error is unclear.

The five-point Likert-type scale, where responses range from 5 = strongly agree to 1 = strongly disagree. All questions in this questionnaire were phrased negatively. That means a strongly agree with the item represents a relatively low level of the attribute being measured.

Lastly, there was an open format or an open-ended question about any other comments that may have been important about medication administration errors and reporting them or any suggestions that may help in motivating nurses to report medication administration errors.

3.8 Validity of the instrument

The validity of the instrument was established via two steps. The first step, a comprehensive review of the literature in the area of medication administration errors reporting specifically focused on nursing practice. The following databases were used for all searches: CINAHL, PubMed and Scopus. Moreover, validity was established by reviewing previously published survey instruments on medication administration errors and reporting to ensure that they were representative of what nurses should know about medication administration errors reporting (Almutary & Lewis 2012; Lin & Ma 2009; Okuyama, Sasaki & Kanda 2010; Wakefield, Uden-Holman & Wakefield 2005).

Second step, to establish content validity, two experts, who are experienced in clinical nursing field and academic nursing field examined the entire survey and offered feedback and suggestions on its content. Some changes were made to the survey based on the comments of the experts. These two experts helped with word choices and examined each part. They both agreed that the content of the questionnaire was understandable and clear.

3.9 Reliability of the instrument

Reliability of the instrument also was established via two steps. The first step was piloting the tool to examine whether the three parts which were: the demographics and background, nurses' perceptions of reporting medication administration errors and the potential barriers to reporting medication administration error items in the questionnaire had internal consistency. The researcher recruited ten nurses, seven of them from the target group and three of them who were close to the same culture and setting to pretest it. The researcher observed directly two of them while completing the survey. Nurses were asked whether the questionnaire was

understandable and whether the topic of the questionnaire was important to their practice. Nurses' responses indicated that the questions were clear and understandable and agreed that the topic was important and significant to nursing profession.

The second step was using Cronbach's alpha test. Cronbach's alpha is a test estimating internal consistency of the measurement which takes a value between 0 and 1; higher values indicate higher reliability. According to George and Mallery (2003, p. 109), as a rule of thumb, a Cronbach's alpha value of less than 0.60 is questionable but above that is acceptable. The reliability of the questionnaire (Cronbach's alpha 0.86) and most of the subscales (except one) were acceptable. The subscale Cronbach's alphas were 0.462 for part (2) (the perception of reporting medication administration errors), 0.901 for part (3a) (potential barriers to reporting medication administration errors (personal factor)), 0.826 for part (3b) (potential barriers to reporting medication administration errors (administrative barriers)) and 0.883 part (3c) (potential barriers to reporting medication administration errors (reporting system factors)) (See Table 1).

Table 1: Reliability Statistics

Dimension	Cronbach's alpha test	N of items
part (2) the perception of reporting medication administration errors	0.462	5
part (3a) potential barriers to reporting medication administration errors (personal factor)	0.901	6
part (3b) potential barriers to reporting medication administration errors (administrative barriers)	0.826	4
part (3c) potential barriers to reporting medication administration errors (reporting system factors)	0.883	4

The relatively low Cronbach's alpha of part (2) subscale could be as a result of a very wide difference of opinion between respondents. Hence the subscale was used on that assumption.

3.10 Data Collection

The survey collected four categories of data. The first were participant demographic and background data. The second was about participants' opinions and perceptions regarding reporting MAEs. The third was about the potential barriers to reporting MAEs, which consisted of three parts: a) personal factors, b) administration factors, and c) reporting system factors. In the last item, survey respondents were asked to answer an open-ended question about their opinions and suggestions to improve MAEs reporting. The survey was administered to a sample of nurses working in three hospitals in the southern region of Saudi Arabia.

The researcher attended the monthly nursing management meeting in the three hospitals to provide an overview about the research. The researcher conducted a brief presentation of no more than ten minutes targeting all nurses in the main auditorium of each hospital providing a summary of information about the research's aims and scope to ensure that they have a clear understanding of the study and its process. Some announcement posters were used to invite the participants and were posted on the staff notice board (Appendix 5).

All the hard copies of the questionnaires were distributed by the researcher with the Participant Information Sheet (Appendix 6) attached and a return reply envelope using hand delivery. Completed survey secured boxes were distributed and placed in the nursing staff rooms where participants could place completed questionnaires. On a weekly basis, the researcher checked these secured boxes. After two weeks from distributing the survey, colorful reminder posters were posted on the nursing staff notice board and distributed to all nurses to maximize the response rate. The questionnaire was in English as English was the standard channel of professional and formal communication in the Saudi health care system (Almutairi, McCarthy & Gardner 2014).

3.11 Statistical Data Analysis

The student researcher performed statistical analysis with the assistance of a professional statistician. Analysis of the quantitative data was done using the Statistical Package for the Social Sciences Software the IBM SPSS Statistics Version 23 software for Windows. The researcher completed data entry for all the survey responses and checked all of the data for missing values.

Several statistical analyses were used as follows. Firstly, frequency tables were generated as part of the sample characterization using the demographics. The results were plotted in bar graphs in Section 4.3. Secondly, with respect to parts II and III of the questionnaire, the mean scores of each respondent for each of the items in the relevant section of the questionnaire were calculated. Using these means, comparison of means was done to compare means between elements of the demographic factors (gender, age groups, ethnic groups, education levels, post graduate experience and working area). Comparison of means was necessary to rank items/factors using either the t-test or Analysis of Variance (ANOVA) with post-hoc analysis accordingly. The Least Significant Difference (LSD) was used for post hoc analysis. Based on the comparison of means, it was possible to establish whether there were significant differences between elements of the demographic factors, e.g. between males and females.

Both the t-test and the ANOVA were used because the data satisfied the assumptions of these statistical tests. The t-test was used when there were only two means to compare such as comparing perceptions between the two genders. The ANOVA was used when there were more than two means to compare such as comparing mean between age groups.

For the qualitative data the researcher used qualitative content analysis approach (Hsieh & Shannon 2005). Data was transferred from the questionnaires to Microsoft Word files for analysis. The data from the open-ended question was carefully read numerous times so that the occurring key elements and words started to emerge from the data and could be listed to describe all possible aspects of the content. The considerations or themes arising in the participants' responses were carefully chosen as the analysis unit (Elo & Kyngäs 2008). Then, the most frequently repeated themes and words were further used as the codes for the main themes of the text. The comments then fell naturally into three major themes. The three themes were: process, perception, and barriers.

An a priori alpha level was set at 0.05 to reduce the chances of a type I error. To describe demographic data of respondents, the researcher used descriptive statistics to analyse the data by calculating frequencies, range of frequencies, standard deviations, means, and percentages.

Three phases of statistical analysis were used:

- (1) the operationalization of the reliably measured variables that can be analyzed statistically;
- (2) confirmatory factor analysis and reliability analysis

- (3) analysis of variance to identify the effect of the nine demographic variables on the mean scores of the other dimensions which are: Perception of Reporting Medication administration errors (part 2), Personal Factors (part 3a), Administration factors (part 3b), and Reporting process factors (part 3c).

In addition, the t-test was used to compare means of variables with two factors. Also, for those variables having more than two groups, analysis of variance (ANOVA) was calculated with appropriate post-hoc tests to determine if there were significant differences between the means. Pearson's correlation was used to examine the relationships between demographics and potential barriers.

The operationalization of the variables involved converting the components of the conceptual model into reliably measured variables that could be statistically analyzed (Allen & Yen, 2002). The demographic variables and the value labels used to define the demographic characteristics of the respondents were: district, gender, age, ethnicity, level of education, years of nursing experience, area of working, job position, frequency of medication administration error, the way used to report MAEs, frequency of reporting MAEs (see Table 2).

Table 2: Coding

Characteristic Category		Value Label
District	Asir Central Hospital (750 nurses employed)	1
	Khamis Mushayt General Hospital (140 nurses employed)	2
	Ahad Rufaidah Hospital (48 nurses employed)	3
Gender	Male	1
	Female	2
Age Variables	< 25 Years	1
	25 – 40 Years	2
	< 40 Years	3
Ethnicity	Arabian	1
	Asian	2
	Western	3
	Other	4
Education Level	Diploma	1
	Bachelor	2
	Post Graduate	3
Nursing Experience	< 1 Year	1
	1 – 5 Years	2
	6 – 10 Years	3
	> 10 Years	4
Area of Working	Medical Ward	1
	Surgical Ward	2
	Paediatric Ward	3
	Intensive Care Unit	4
	Emergency Department	5
	Dialysis Unit	6
	Operation Room	7
Job Position	Staff Nurse	1
	Head Nurse	2
	Nursing Supervisor	3
	Nursing Administration	4
	Other	5
Have you ever made a medication administration error?	Yes	1
	No	2
Have you ever reported any medications errors?	Never	1
	Mostly	2
	Always	3

3.12 Qualitative Data Analysis

For the qualitative data the researcher used qualitative content analysis approach (Hsieh & Shannon 2005). Data was transferred from the questionnaires to Microsoft Word files for analysis. The data from the open-ended question was carefully read numerous times so that the occurring key elements and words started to emerge from the data and could be listed to describe all possible aspects of the content. The considerations or themes arising in the participants' responses were carefully chosen as the analysis unit (Elo & Kyngäs 2008). Then, the most frequently repeated themes and words were further used as the codes for the main themes of the text. The comments then fell naturally into major themes. The researcher linked the themes to each other and to the whole study. Then all of these themes were extracted and associated with the other factors. This process was done by the first author and the research supervisors together.

3.13 Ethical considerations

Ethical permission to conduct the study was obtained from the Human Research Ethics Committee (HREC) at the University of Adelaide in Australia on 26 May 2016, approval number H-2016-110 (appendix 3). Furthermore, this study involved Institutional Review Board (IRB) approval from the Ministry of Health in Saudi Arabia on May 16, 2016, approval number 16-188E (appendix 4). Furthermore, the researcher was also granted a written permission to conduct the research study from The General Directorate of Health Affairs in Asir, which is linked to the Ministry of Health (Appendix 2).

3.13.1 Informed consent and Free of Harm

Participation in this study was entirely voluntary. Participants were informed that by completing the questionnaire, they indicated their consent to participate in this study. There were little burden and low risk to the participants. It is possible that participants could experience mild anxiety or psychological distress related to possible feelings of guilt or embarrassment because the questions may remind some participants of errors that have made previously. For management of risks, every participant was informed in writing that he or she could decline to participate and could withdraw by exiting the survey before the survey completion. Moreover, with focus on helping participants in need, the researcher met social workers in each hospital prior to conducting the study and arranged for participants' risk management. Then researcher advised the participants about the availability of psychological support. The researcher provided the participants with the social workers' contact numbers

and location of social workers' office in every participant's sheet. Aside from giving up some time, and possible psychological harm this study is unlikely to contain or include any other burdens or risks issues to participants.

3.13.2 Anonymity, Privacy and Data Storage

Anonymity, privacy, and confidentiality were respected and prioritized by the researcher as they are both a legal and an ethical requirement (Whitehead et al. 2007). To ensure anonymity, the researcher did not ask the participants to sign the informed consent. The questionnaire was completely anonymous such that even the researcher was not able to identify the participants.

Several steps were taken to ensure best practice:

- All data sections including the demographic data section for both the actual and piloting participants, did not collect any personal or contact details of the participants such as names, email addresses, home addresses or even any identification numbers that could be used to identify participants.
- To ensure confidentiality the researcher provided a return unmarked secured envelope to each participant to put the completed questionnaire in, to avoid any participant concerns about loss of anonymity that might result from a central collection area in the hospital.
- To ensure privacy, only the researcher and supervisors were allowed to access to the data.
- All written materials and hard copies of the questionnaires were secured in a locked cupboard that only research team members can access.
- Written materials will be kept for a period of five years then completely destroyed by shredding.
- All electronic data is stored electronically, secured by a password and saved in the University of Adelaide's server and this information will not be used for any purpose unrelated to the research project itself.

3.14 Conclusion

This chapter described the design of the study including the study population (including inclusion/exclusion criteria), recruitment strategies, ethical issues, data-gathering instrument, issues of validity and reliability and statistical analysis. The researcher used both quantitative

and qualitative data. A cross-sectional, descriptive survey with a self-administered questionnaire was used to examine the nurses' perceptions of reporting medication administration errors and the potential barriers to reporting MAEs among nurses in Saudi Arabia. Purposive non-probability sampling approach was used and data were collected from nurses who work in three hospitals in the south region of Saudi Arabia. Sample included all nurses who have completed 6 month of employment at the time of the study regardless their gender, age, education level, post-graduate experience, the working area, and job position.

The validity and reliability of the questionnaire was addressed in this chapter. Finally, the research discussed all issues related to the ethical considerations of securing informed consent, data storage, and anonymity and privacy.

The next chapter will present to findings of the study.

CHAPTER 4: RESULTS

4.1 Introduction

This chapter reports the results of data analysis and findings of the current study. This chapter starts with the response rate for return of the questionnaire. Then the findings are presented in three parts. The first part contains all demographics and background of the participants such as; gender, age, ethnicity, education, years of post-graduate nursing experience, are of working, job position, the frequency of reporting MAEs, and the way used to report MAEs. The second part contains the nurses' perceptions of reporting MAEs. The third part presents both quantitative and qualitative results. Quantitative results consist of the three potential barriers to reporting MAEs which are; the personal factors, the administration factors, and the reporting process factors.

4.2 Response Rate

Six hundred nurses throughout the three involved hospitals who currently work providing either direct or indirect inpatient care were invited to participate in this study. At the time of the study, the respondent nurses were current members of the Saudi Commission for health Specialties. Participation was voluntary and those not wishing to participate did not return the survey.

Out of 600 potential participants, 220 were not returned and 14 of the surveys were returned but not useable because they did not meet the inclusion criteria or the survey was not completed. Of the remaining 380 potential respondents, 366 returned the surveys for a response rate of 63.3%.

4.3 Questionnaire Part 1: Demography of the participants

Participant demographics were district, employment for 6 months or longer, gender, age group, education level, post graduate experience, the working area, nurse's job position, if experience medication administration error, frequency of reporting medication administration error and the way used to report medication administration error.

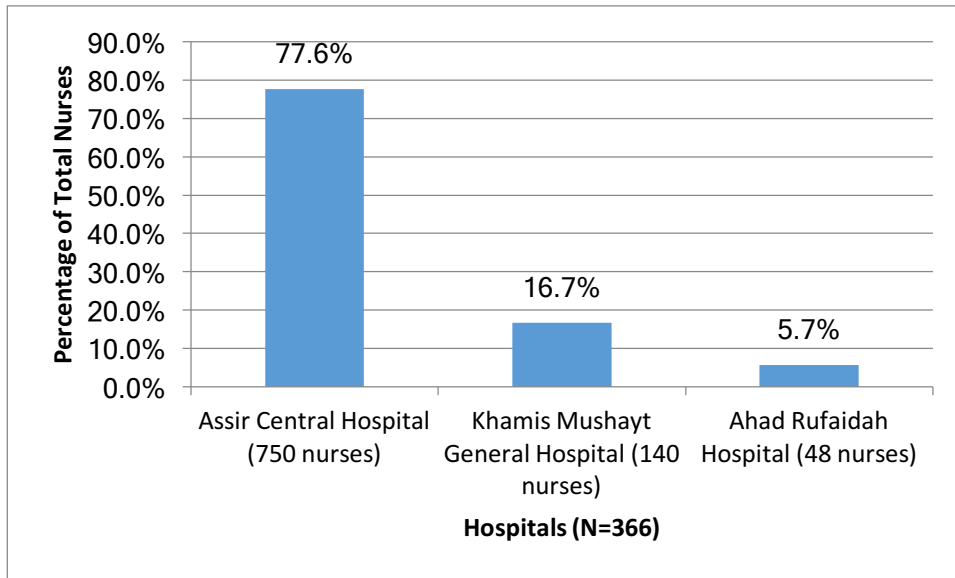


Figure 1: Participants by hospital (number of nurses employed)

As shown in Figure 1, most participants (77.6%) were from Assir Central Hospital. This is because the hospital is bigger and has more nurses than the other smaller hospitals.

Figure 2 shows that most of the respondents (94.8%) were female. Of the participants, 19 were male and 347 were female.

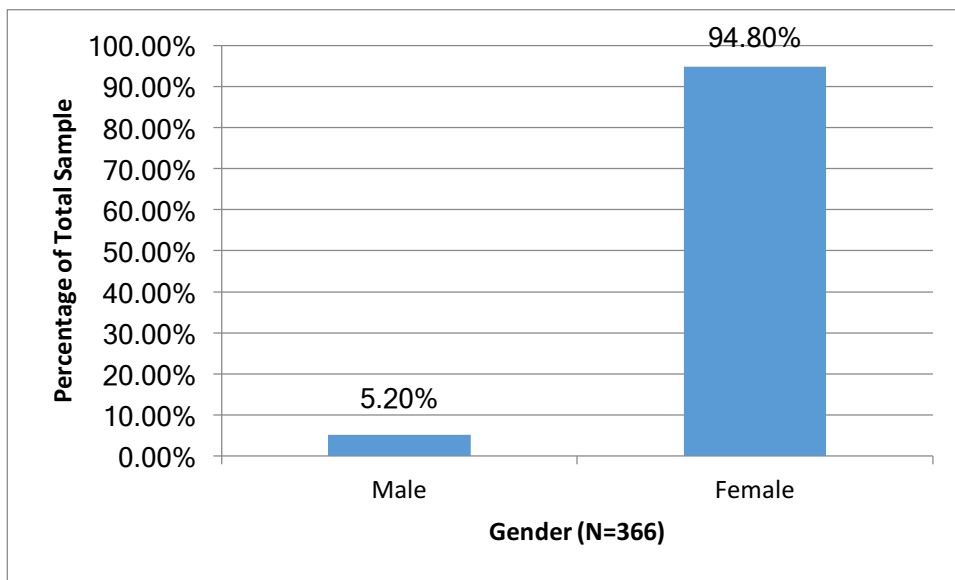


Figure 2: Gender distribution of research participants

The most common participant's age range was 25 - 40 years old (74.3%), followed by > 40 years old (18.0%), and the age range < 25 years old was the least responses 5.2% (Figure 3).

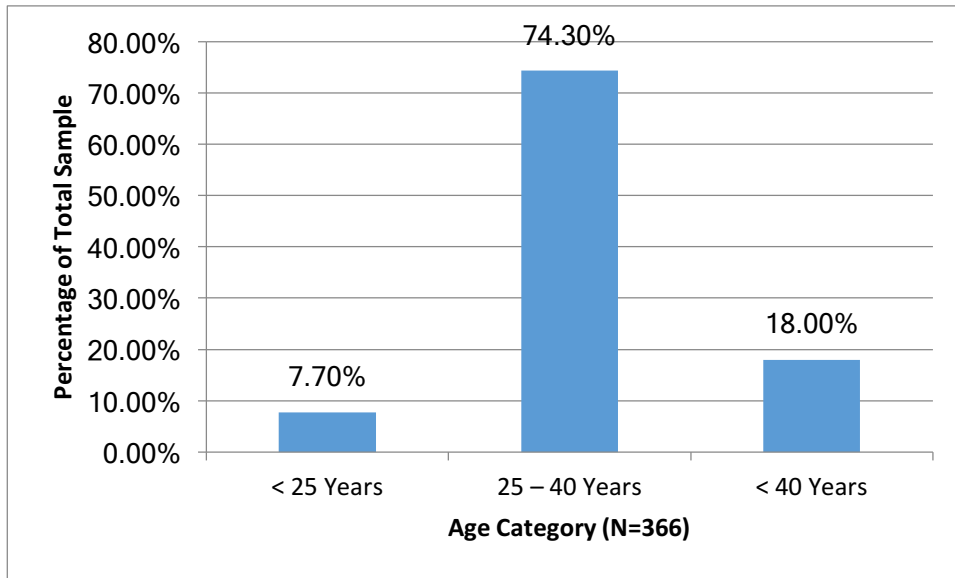


Figure 3: Participants Age Category

In terms of ethnicity, more than half of the respondents were Asian (58.2%), with the remaining (20.8%) being Arabian, (1.6%) being Western and the rest (19.4%) being other (Figure 4).

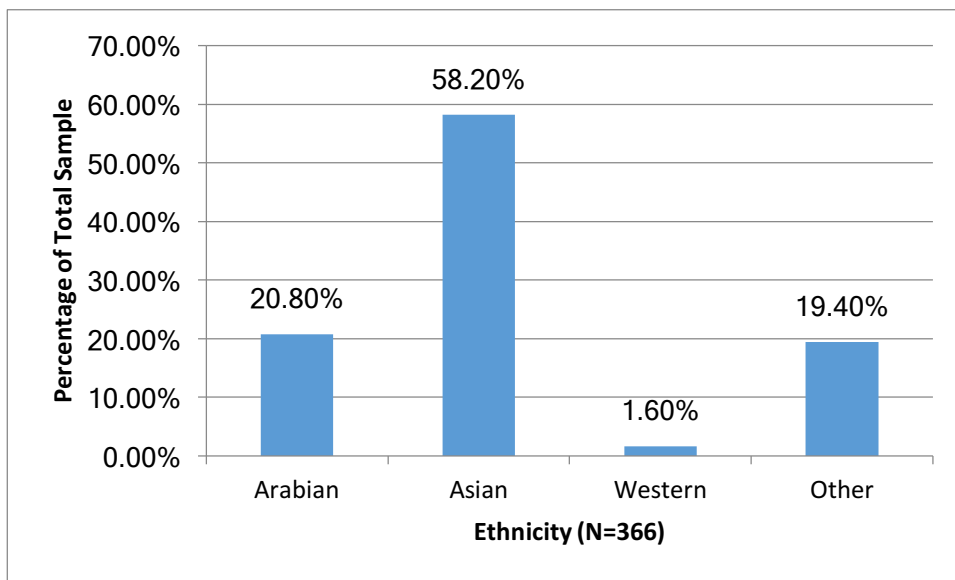


Figure 4: Participants' Ethnicity

The level of nursing education of the participants is outlined in Figure 5. The majority of the nurses (69.7%) responding held bachelor degree and 29.0% of respondents held diploma in nursing. Lastly, the minority of respondents 1.4% held post graduate degrees, such as a master's degree in nursing, a doctorate, or a master's degree in a related field.

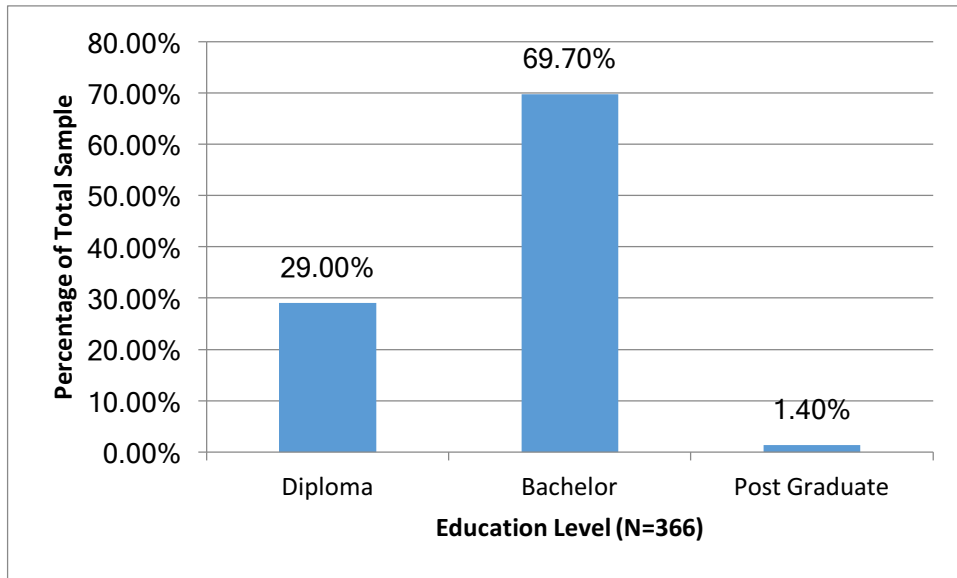


Figure 5: Participants' Education Level

Years of clinical experience ranged from less than one year to more than 10 years of nursing experience. Slightly more than half of the participants fell in the one to five years of nursing experience category (53.6%). Then, 26.0% of participants had from six to ten years of nursing experience, 19.7% of respondents had more than ten years nursing experience whereas, only (0.8%) had less than one-year nursing experience (Figure 6).

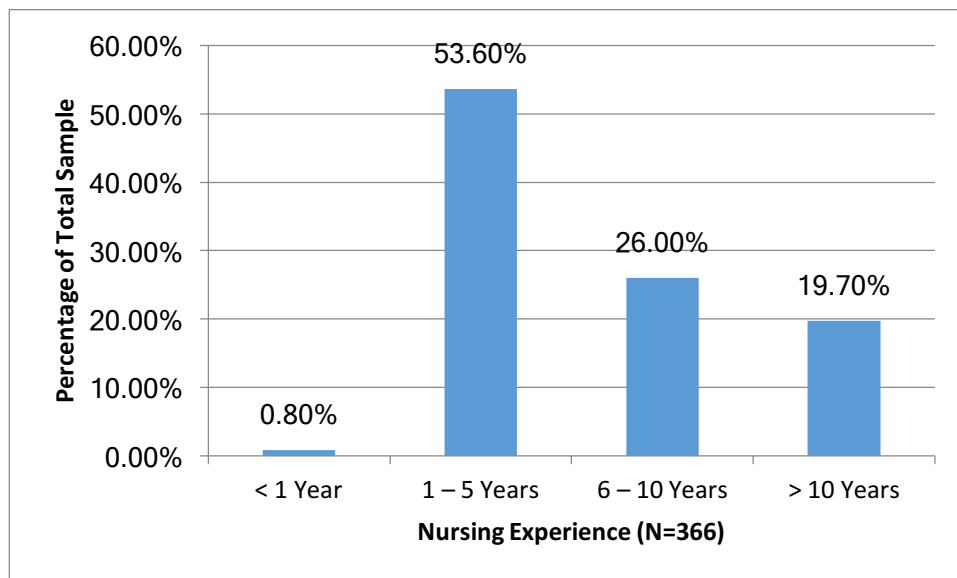


Figure 6: Participants' Nursing Experience

About the area of working, most participants work in medical wards (27.9%). Intensive care units have 26.0% of respondents. The remainder are as follows: surgical wards, 13.1%;

dialysis units, 6.3%; operation rooms, 4.1%; emergency departments, 2.7%; and, paediatric ward, 1.9% (Figure 7).

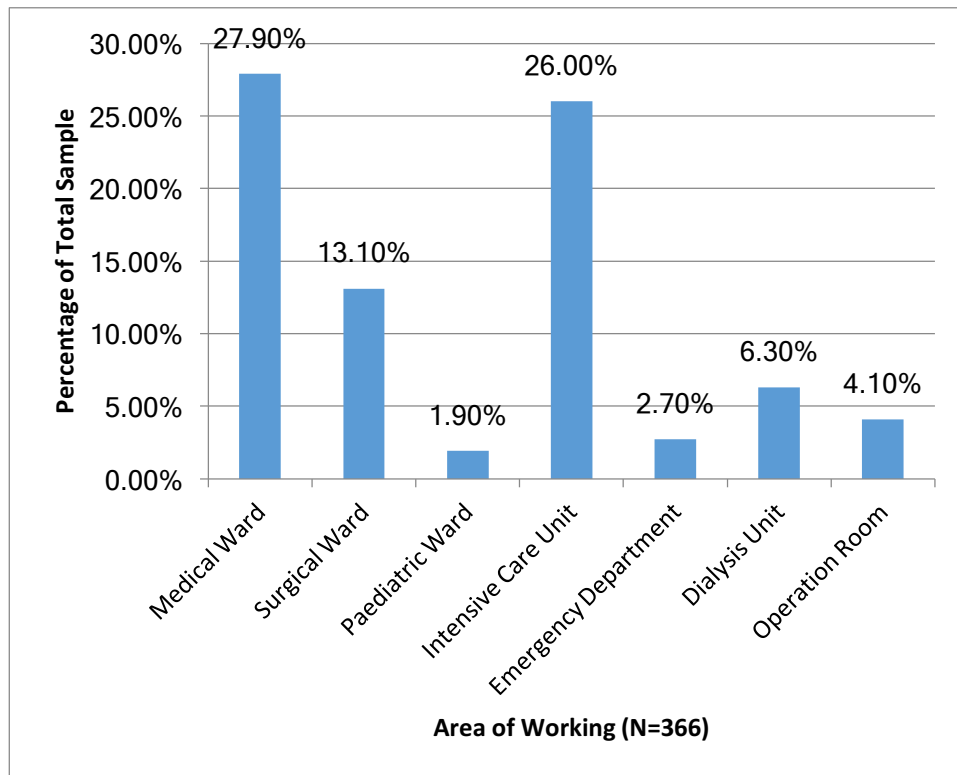


Figure 7: Participants' Area of Working

When respondents were asked about their job position, the majority of them (88.5%) were staff nurses, 4.9% of participants were head nurses, 3.6% were nursing supervisors, 1.6% of participants work in nursing administration and 1.4% of participants were other (Figure 8).

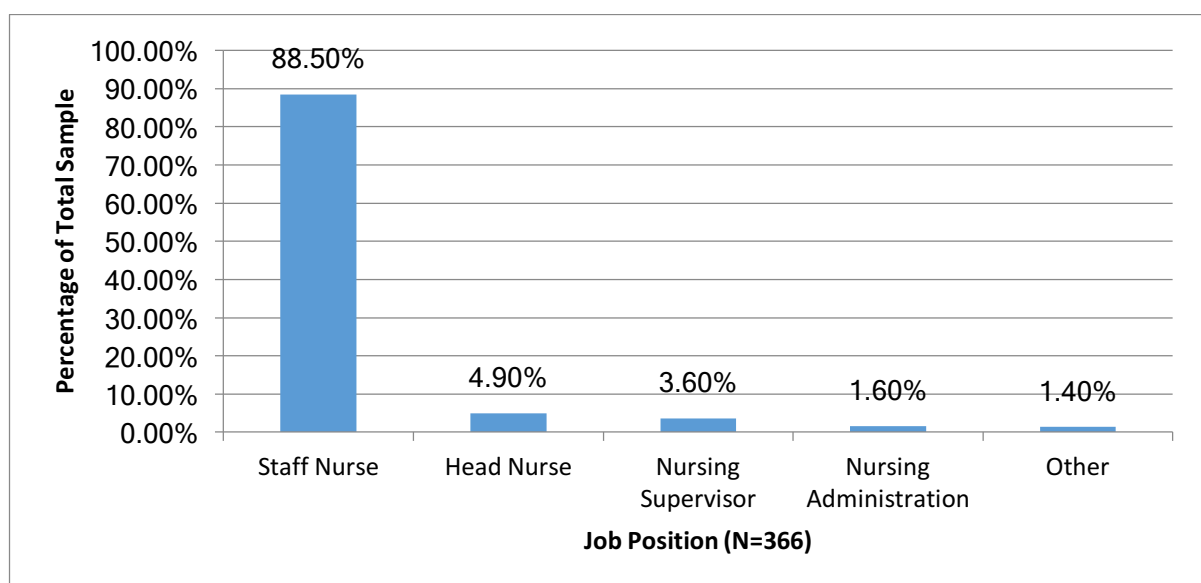


Figure 8: Participants' Job Position

With respect to making MAEs, 24.9% of participants indicated that they have not made any MAEs during their career and 75.1% admitted that they made an MAE.

Respondents were asked to answer this question only if they had answered 'Yes' (n= 91) in question nine (Appendix 1). Almost half (48.4%) of the 91 participants who answered yes in the previous question stated that they mostly reported their MAEs. Almost twenty-nine (28.6%) believed that they always reported their MAEs. The remaining 23.1% answered that never reported MAEs (Figure 9).

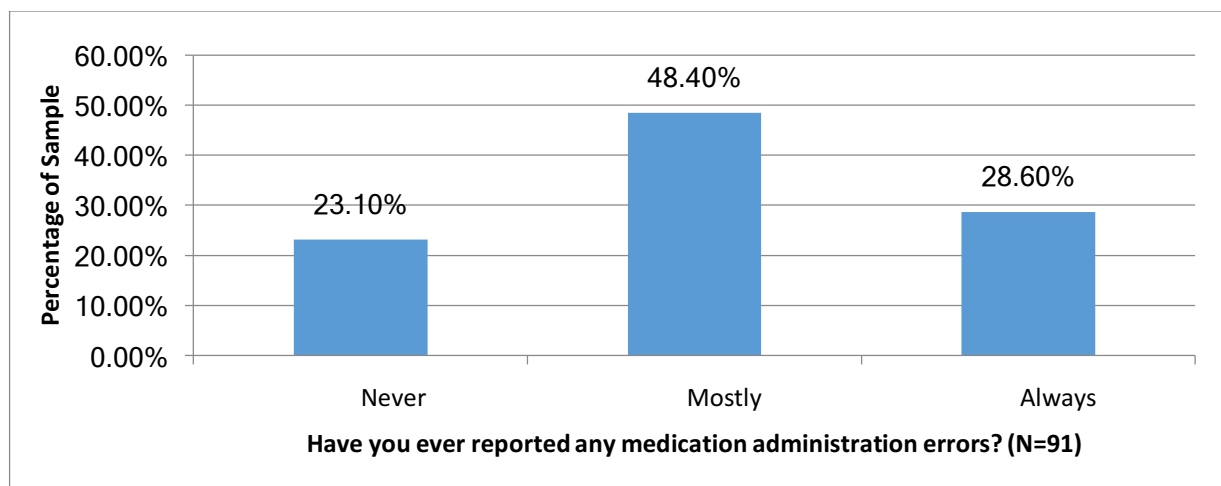


Figure 9: Ever Reported Medication administration errors

Respondents were asked to answer this question only if they had answered 'Yes' (n= 91) in question nine. When respondents were asked which way they used to report MAEs, half of them (49.4%) indicated that they used the MAEs reporting system while 43.9% respondents answered that they notified nurse in charge. Only six respondents (6.5%) indicated that they notified patient's primary physician.

In order to score the quantitative data, descriptive analyses were conducted by calculating means and standard deviations for individual items and for subscales. The author followed the calculation that is shown in the following Table 3:

Table 3: Questionnaire Scales

Mean range	Decision
1 to less than 1.80	Strongly disagree
1.80 to less than 2.60	Disagree
2.60 to less than 3.40	Neutral
3.40 to less than 4.20	Agree
4.20 to less than 5	Strongly agree

The range was designed to evenly spread the scale between 1 and 5.

4.4 Questionnaire Part II: Nurse’s perception to report medication administration error/s

As shown in Figure 10 below, the mean score (4.66) of the answer for the question “When a medication administration error occurs I think it, should be reported?” was in the strongly agree score. The SD (0.579) shows a strong agreement between participants. The mean score (4.3) for participant’s response when they were asked, “I believe that reporting medication administration errors is a worthy use of my time” was also in the strongly agree score category. However, the SD (0.812) showed less agreement between participants.

Agree was the mean score of the participant’s response when they were asked, “I am likely to report a medication administration error even if it did not harm the patient” (3.86) and “I am likely to report a medication administration error only when similar errors have occurred previously in the department” (3.6). Both SDs of 1.207 and 1.145 respectively showed less agreement between participants than before.

The last question, “I would report a medication administration error even if I was not involved in it” had a mean score of 2.85 and an even bigger SD of 1.386 showing that participants preferred to be neutral and the responses were very varied.

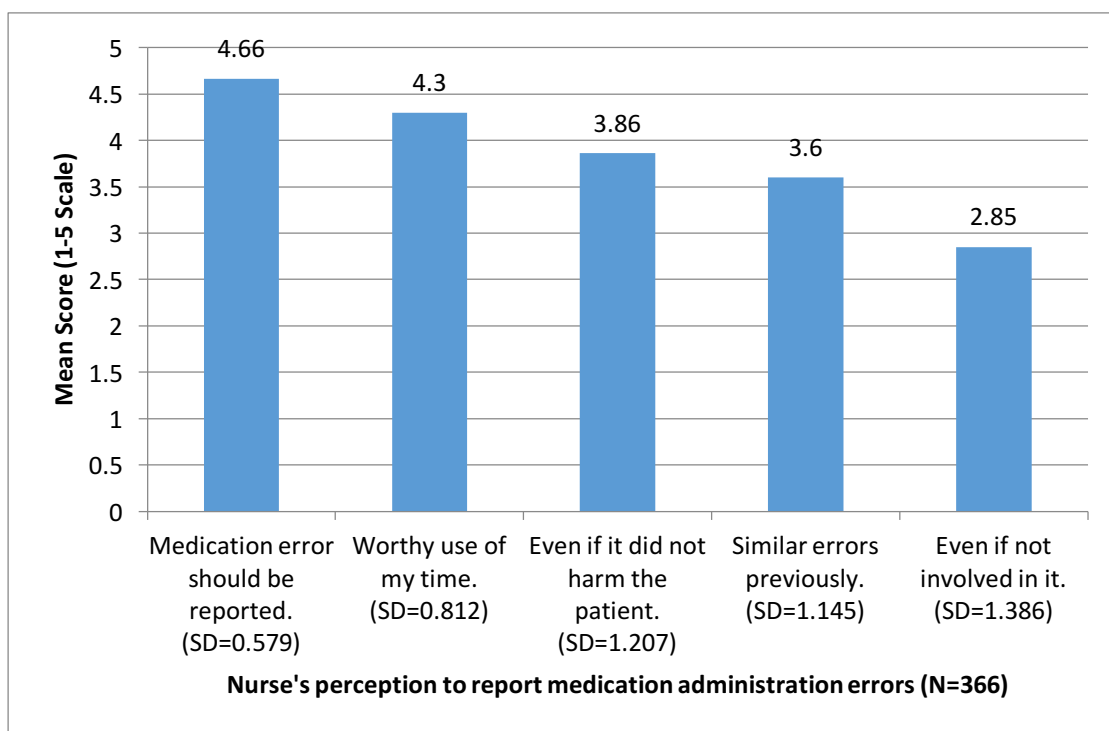


Figure 10: Nurse's perception to report medication administration error/s

4.4.1 Gender Differences on Nurse's perception to report medication administration error/s

An independent samples t-test statistical analysis was used to compare males and females in terms of their perception to report medication administration errors.

The independent samples t-test ($t = 2.059$) shows that the p-value is less than 0.05 (0.040), therefore we eliminate the null hypothesis and conclude that there is significant difference between males and females with respect to their perceptions towards reporting medication administration errors.

4.4.2 Effect of Age on Nurse's perception to report medication administration error/s

Analysis of variance with post hoc analysis was conducted to find out if there are significant differences between the three age groups in terms of their perceptions to report medication administration errors. The results show that there are no significant differences between all the three age groups (Sig. 0.577; 0.694 and 0.728). Hence all age groups are likely to have the same inclination towards reporting medical administration errors.

4.4.3 Effect of ethnic group on Nurse's perception to report medication administration error/s

The results of analysis of variance shows that the nurses of Arabian ethnic group have a significantly higher perception to report medication administration errors than others

followed by Asian and Western (which have significant difference between them). The ethnic group “Other” has a significantly lower perception than Arabian and Asian but no significant difference with Western group. The table below shows the results.

Table 4: ANOVA significance levels - ethnic groups and perception to report MAEs

Ethnicity - Ethnicity	Sig.
Arabian - Asian	.002
Arabian - Western	.307
Arabian - Other	.000
Asian - Western	.964
Asian - Other	.006
Western - Other	.397

*. The mean difference is significant at the 0.05 level.

4.4.4 Effect of Education Level on Nurse's perception to report medication administration error/s

The results show that there are no significant differences between all the education levels with respect to their perception of reporting MAEs (p-value = 0.578).

4.4.5 Effect of Post Graduate Experience on Nurse's perception to report medication administration error/s

The results of analysis of variance show that there is no significant difference (p-value = 0.253) between any of the post-graduate experience groups with respect to perception to reporting of MAEs.

4.4.6 Effect of Working Area at Hospital on Nurse's perception to report medication administration error/s

The results show that there are no significant differences (p-value = 0.516) in nurses' perception to report MAEs between nurses working in different areas.

4.5 Questionnaire Part III: Potential barriers affecting the reporting of medication administration error(s)

Objective 2 required the analysis of the factors which are barriers to reporting of medication administration error(s). Three factors were used namely, personal factors, administrative factors and reporting process factors.

4.5.1 Personal Factors

This section explains the results of analyzing personal factors as barriers to reporting of MAEs for each demographic attribute.

4.5.1.1 Gender differences on personal potential barriers report medication administration error/s

An independent samples t-test statistical analysis was used to compare between males and females in terms of their personal potential barriers to report medication administration error/s.

The result of the independent t-test ($t = 0.924$) show that the p-value is more than 0.05 (0.053), therefore we accept the null hypothesis and conclude that there is no significant difference between males and females in terms of personal barriers to reporting medication administration errors.

4.5.1.2 Effect of age on personal potential barriers report medication administration error/s

Analysis of variance with post hoc analysis was conducted to find out if there are significant differences between the three age groups in terms of their personal barriers to report medication administration errors.

The results show that the age group above 40 has significantly more negative personal barriers than the other two age groups. However, there is no significant difference between the less than 20 and 25-40 age group. The table below shows the results.

Table 5: ANOVA significance levels – age group and potential barriers to report MAEs

Age - Age	Sig.
< 25 year - 25 - 40 years	.256
< 25 year - > 40 years	.012
25 - 40 years - > 40 years	.012

4.5.1.3 Effect of ethnic group on nurse's perception to report medication administration error/s

Although the means show that the Western ethnic group has a significantly more negative perception of personal barriers to reporting MAEs than all the other groups, the ANOVA test did not detect significant differences between Western ethnic group and others. However, there is a significant difference between the Asian and Arabian. The table below shows the p-values and the means.

Table 6: ANOVA significance levels – ethnicity and perception to report MAEs

Ethnicity - Ethnicity	Sig.
Arabian - Asian	.003
Arabian - Western	.591
Arabian -Other	.092
Asian- Western	.135
Asian- Other	.405
Western- Other	.234

Table 7: Means – ethnicity and perception to report MAEs

Ethnicity	N	Mean	SD
Arabian	76	3.4789	1.00350
Asian	213	3.0977	.99633
Western	6	3.7000	.45166
Other	71	3.2085	.87729
Total	366	3.2082	.97993

4.5.1.4 Effect of education level on personal potential barriers report medication administration error/s

The results show that there are no significant differences (p-value = 0.207) between all the education levels with respect to their perception of perception of barriers of reporting MAEs.

4.5.1.5 Effect of post graduate experience on personal potential barriers report medication administration error/s

The results showed the following difference between postgraduate experience groups with respect to perception of personal factors as barriers to reporting of MAEs. There is no significant difference between 6-10 years and >10 years. However, <1 year is significantly different from the other years. Hence nurses with less than one year have a significantly more positive perception of personal barriers to reporting MAEs than others. Nurses with 1-5 years have a significantly more positive perception of personal factors as barriers to reporting MAEs than those with >10 years. The table below shows the p-values and the means.

Table 8: ANOVA significance levels – nursing experience and personal potential barriers to report MAEs

Nursing exp. – nursing exp.	Sig.
< 1 year - 1 - 5 years	.144
< 1 year - 6 - 10 years	.082
< 1 year - > 10 years	.049
1 - 5 years - 6 - 10 years	.170
1 - 5 years - > 10 years	.025
6 - 10 years - > 10 years	.378

Table 9: Means – nursing experience and personal potential barriers to report MAEs

Nursing exp.	N	Mean	SD
< 1 year	3	4.1333	.41633
1 - 5 years	196	3.3041	.99958
6 - 10 years	95	3.1368	.95573
> 10 years	72	3.0028	.93115
Total	366	3.2082	.97993

4.5.1.6 Effect of working area at hospital on personal potential barriers report medication administration error/s

The results show that there is no significant difference (p-value = 0.279) between nurses working in the difference areas of the hospital with respect to perceptions on personal potential barriers to reporting MAEs.

4.5.2 Administrative factors as Potential Barriers

As shown in the Table 10, the mean of the answer for the question “nursing administration may believe that medication administration errors are a measure of the quality of nursing care that I provided’ was located at agree score (Mean = 3.75). Agree also was the mean for participant’s response when they were asked about the risk that they may be punished by

nursing administration. (This may affect my annual performance evaluation or having my contract terminated) (Mean = 3.55). The mean for participant's response when they were asked about nursing administration focusing on the individual nurse as the primary cause of the medication administration error rather than seeing it as a system problem (e.g. environmental causes, poor communication) was in the Agree range (Mean = 3.53). Agree also was the mean for participant's response when they were asked about that the response by nursing administration may not match the severity of the medication administration error (i.e. a relatively simple error results in a significant punishment) (Mean = 3.43).

Table 10: Administration Factors as barriers to reporting MAEs

Items	N	Mean	Std. Deviation	Decision
Nursing administration may believe that medication administration errors are a measure of the quality of nursing care that I provided	366	3.75	1.008	Agree
If I were to report a medication administration error/s there is a risk that I may be punished by nursing administration. (This may affect my annual performance evaluation or having my contract terminated)	366	3.55	1.093	Agree
Nursing administration would focus on the individual nurse as the primary cause of the medication administration error rather than seeing it as a system problem (e.g. environmental causes, poor communication)	366	3.53	1.131	Agree
The response by nursing administration may not match the severity of the medication administration error (i.e. a relatively simple error results in a significant punishment)	366	3.43	1.112	Agree

4.5.2.1 Gender differences on administrative potential barriers report medication administration error/s

The results of the independent t-test show that the p-value is greater than 0.05 (p-value = 0.243). Hence the null hypothesis is accepted and we conclude that there is no significant difference between males and females with respect to administrative barriers to medical administration errors reporting.

4.5.2.2 Effect of age on administrative potential barriers report medication administration error/s

Analysis of variance with post hoc analysis was conducted to find out if there are significant differences between the three age groups in terms of their perception of administrative barriers to report medication administration errors.

The results show that the age group above 40 has significantly more positive perception of administrative barriers than the less than 25 age group (p-value 0.010), but not more than the 2-40 years age group (p-value = 0.078). However, there is no significant difference between the less than 25 and 25-40 age group (p-value = 0.093).

4.5.2.3 Effect of ethnic group on administrative potential barriers report medication administration error/s

The results show that there is no significant difference (p-value = 0.300) between all ethnic groups with respect to perception of administrative barriers to reporting MAE.

4.5.2.4 Effect of education level on administrative potential barriers report medication administration error/s

The results show that there are no significant differences (p-value = 0.731) between all the education levels with respect to their perception of administrative barriers of reporting MAE.

4.5.2.5 Effect of post graduate experience on administrative potential barriers report medication administration error/s

There are no significant differences between (p-value = 0.275) all age groups with respect to administrative factors as barriers to reporting MAE.

4.5.2.6 *Effect of working area at hospital on administrative potential barriers report medication administration error/s*

The report shows that nurses working in the emergency department have a significantly more positive perception towards administrative barriers to reporting MAE. All the other working areas have no significant differences between them. The table below shows the p-values.

Table 11: ANOVA significance levels – area of working and personal administrative potential barriers to report MAEs

Area of working – Area of working	Sig.
medical ward - Emergency department	.003
surgical ward - Emergency department	.011
pediatric ward - Emergency department	.015
Intensive care unit - Emergency department	.001
Emergency department - Dialysis unit	.032
Emergency department - Operation room	.001
Emergency department - Other	.003

4.5.3 Reporting Processes Factors

As shown in the Table 12, the mean of the answer for the question “Incident report forms are too complicated” was neutral (Mean = 2.96). Neutral also was the mean for participant’s response when they were asked “Incident reporting takes too much time (e.g. filling out the report, contacting the physician)” (Mean = 2.87). Disagree was the mean for participant’s response when they were asked, the hospital's definition of a medication administration error is unclear (Mean = 2.54). Disagree also was the mean for participant’s response when they were asked “The hospital's definition of a medication administration error is unclear” (Mean = 2.43).

Table 12: Reporting Processes Factors

Items	N	Mean	Std. Deviation	Decision
Incident report forms are too complicated	366	2.96	1.190	Neutral
Incident reporting takes too much time	366	2.87	1.154	Neutral

(e.g. filling out the report, contacting the physician)				
The hospital's definition of a medication administration error is unclear	366	2.54	1.148	Disagree
The hospital's definition of a medication administration error is unclear	366	2.43	1.088	Disagree

4.5.3.1 Gender differences on reporting process potential barriers report medication administration error/s

The independent t-test ($t=2.878$) showed that the p-value is less than 0.05 (p-value = 0.04), therefore we reject the null hypothesis and conclude that there are significant differences between males and females with respect to their reporting process barriers to medical administration errors. Males have a more negative view of reporting processes as a barrier to MAE.

4.5.3.2 Effect of age on reporting process potential barriers report medication administration error/s

Analysis of variance with post hoc analysis was conducted to find out if there are significant differences between the three age groups in terms of their perception of reporting process potential barriers to report medication administration errors.

The results show that the age groups have no significant difference (p-value = 0.585) between them with regard to perception of reporting process potential barriers.

4.5.3.3 Effect of ethnic group on reporting process potential barriers report medication administration error/s

The results show that there are significant differences between ethnic groups' perception on reporting process potential barriers report medication administration error/s. The Arabian ethnic group has a significantly more negative perception of reporting process barriers to MAE than Asian and Other, but not significantly different to Western. At the same time, there is no significant difference between Asian and Other ethnic groups with respect to reporting barriers to MAE. The table below shows the p-values.

Table 13: ANOVA significance levels – ethnic group and reporting process potential barriers to report MAEs

Ethnicity - Ethnicity	Sig.
Arabian - Asian	.000
Arabian - Western	.109
Arabian - Other	.000
Arabian	.000
Asian - Western	.965
Asian - Other	.083
Arabian	.109

4.5.3.4 Effect of Education Level on reporting process potential barriers report medication administration error/s

The results show that there are significant differences between some of the education levels as follows. The Diploma level nurses have a significantly more negative perception of the reporting process barriers to reporting MAEs than the bachelor's and the postgraduate nurses. There are no significant differences between bachelor and postgraduate level nurses. The table below shows the p-values.

Table 14: ANOVA significance levels – ethnic group and reporting process potential barriers to report MAEs

Education - Education	Sig.
Diploma - Bachelor	.000
Diploma – Post Graduate	.040
Bachelor – Post Graduate	.340

4.5.3.5 Effect of Post Graduate Experience on reporting process potential barriers report medication administration error/s

The results showed that nurses with less than one year have a significantly more negative perception of the reporting process as a barrier to reporting of MAE. The other groups have no significant differences between them. The table below shows the p-values.

Table 15: ANOVA significance levels – nursing experience and reporting process potential barriers to report MAEs

Nursing experience – nursing experience	Sig.
< 1 year - 1 - 5 years	.003
< 1 year - 6 - 10 years	.002
< 1 year - > 10 years	.004
1 - 5 years - 6 - 10 years	.438
1 - 5 years - > 10 years	.799
6 - 10 years - > 10 years	.398

4.5.3.6 Effect of Working Area at Hospital on reporting process potential barriers report medication administration error/s

The results show that the emergency department nurses have a significantly more positive perception of the reporting process as a barrier to reporting of MAE than the paediatric ward. The results also show that the surgical ward nurses have a significantly more positive perception of the reporting process as a barrier to reporting of MAE than the paediatric ward. Other working areas in between have no significant differences between them. The table below shows the p-values.

Table 16: ANOVA significance levels – area of working and reporting process potential barriers to report MAEs

Area of working – Area of working	Sig.
medical ward - surgical ward	.433
medical ward - paediatric ward	.074
medical ward - Intensive care unit	.755
medical ward - Emergency department	.373
medical ward - Dialysis unit	.399
medical ward - Operation room	.903
medical ward - Other	.423
surgical ward - paediatric ward	.039
surgical ward - Intensive care unit	.305
surgical ward - Emergency department	.649
surgical ward - Dialysis unit	.191
surgical ward - Operation room	.563
surgical ward - Other	.165
paediatric ward - Intensive care unit	.095
paediatric ward - Emergency department	.044
paediatric ward - Dialysis unit	.242
paediatric ward - Operation room	.146

paediatric ward - Other	.150
Intensive care unit - Emergency department	.307
Intensive care unit - Dialysis unit	.518
Intensive care unit - Operation room	.969
Intensive care unit - Other	.608
Emergency department - Dialysis unit	.196
Emergency department - Operation room	.420
Emergency department - Other	.214
Dialysis unit - Operation room	.628
Dialysis unit - Other	.779
Operation room - Other	.745

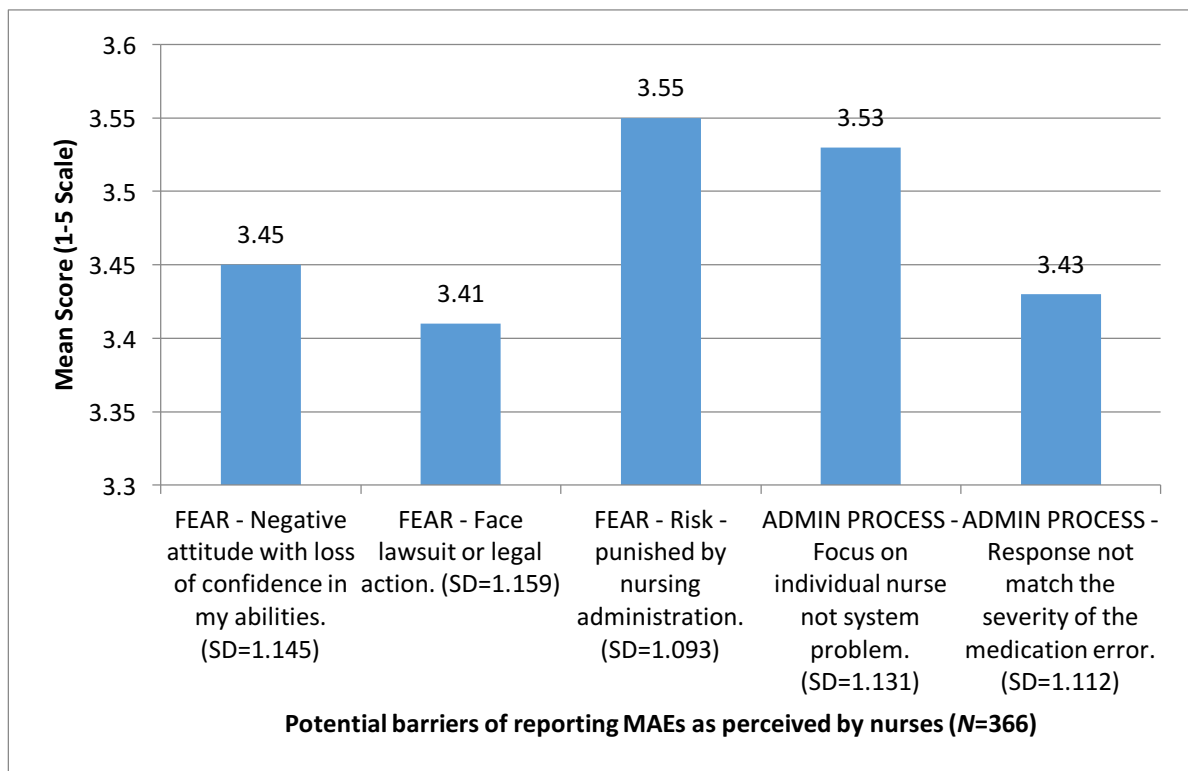


Figure 11: Potential barriers of reporting MAEs as perceived by nurses

4.6 Qualitative findings

Content analysis of the open-ended questionnaire items showed that the response could be classified into three categories which are according to the three parts of the questionnaire namely, process, perception, and barriers. These are presented below.

With respect to the process, respondents strongly expressed suggestions to improve awareness and to simplify the reporting process. Respondent 281 summed up these views by saying:

nurses should be with knowledge enough about reporting medication administration errors.

One of the major barriers which was commonly expressed was that of punishment and blame to the nurses who would have made errors. Respondent 276 put it this way:

reporting medication must not be taken against the nurse who committed the error. Report is done to improve the system/ process not to punish the person who committed the error unless the error was intentionally done.

With respect to perception, nurses general perceive MAEs reporting as an important and necessary action for the welfare of the patient and the reputation of the profession. This include sentiments such as that reporting MAEs “is done to improve the system”, “is a responsibility of a competent nurse”, and “to protect the life of patient”.

4.7 Conclusion

In conclusion, the results from the current study indicated that the participants recognized the importance of reporting their MAEs. Nurses also addressed some barriers that may discourage them from reporting MAEs when occurred, for example, administrative factors.

The next chapter will discuss these results in relation to the aim and objectives of the study and their implication for nursing practice.

CHAPTER 5: DISCUSSION

5.1 Introduction

This section is guided by the study questions and aims. It will integrate and discuss the findings of both quantitative and qualitative analysis.

5.2 Restatement of the problem

This study was conducted to gain a better understand reporting of MAEs. Furthermore, this study was conducted to answer the below questions:

- Is there significant difference in nurses' perception to report medication administration error/s among the demographic attributes of gender, age, ethnicity, level of education, years of post-graduate nursing experience and working area of hospital?
- Is there significant difference in nurses' perceptions of personal, administrative and reporting process factors as potential barriers to report medication administration error/s among the demographic attributes of gender, age, ethnicity, level of education, years of post-graduate nursing experience and working area of hospital?
- What are nurses' suggestions that help in motivating nurses to report medication administration errors?

The three involved hospitals in this study are similar in some regards, but different in others. They are similar in term of the scope of service that they provide. They all also from the same region which means they have almost the same work atmosphere. However, they are different in the capacity of beds.

5.3 Summary description of procedures

To answer these questions a questionnaire was developed consisting of four pages to examine the nurses' perceptions and the potential barriers to the reporting of medication administration errors and an open-ended question to seek more understanding of this topic among nurses in Saudi Arabia. The questionnaire items included: demographics and background, nurses' perceptions of reporting medication administration errors and potential

barriers to reporting MAEs. Participants for this study were nurses from three hospitals in Saudi Arabia.

As expected the result of district variable shows that the majority of participants were from Asir Central Hospital (ACH) as it is the biggest hospital in the South Region of Saudi Arabia. The capacity of Asir Central Hospital is 700 beds of which 150 beds are in the critical care units. It is well known in Saudi Arabia as a teaching center for the school of medicine and nursing for Saudi Ministry of Health and King Khalid University. Then second highest percentage of participants were from Khamis Mushayt General Hospital. The capacity of Khamis Mushayt General Hospital is 150 beds and that provides surgical and medical care. The lowest number of participants were from Ahad Rufaidah Hospital as it is a smaller general hospital that provides surgical and medical services with only 50 beds.

Most participants of this study were female (94.8%). According to the last statistics for nurses from the Saudi Ministry of Health (2014), the nursing in Saudi Arabia is a female-dominated field (Table 17). In this study, there were more female respondents than indicated by the Saudi Ministry of Health (2014) statistics, i.e. 94.8% compared to 74.6%.

Table 17: Gender distribution of nurses' in the Saudi Ministry of Health (2014) and study participants

Gender	Saudi Ministry of Health	Study participant
Male	25.4 %	5.2%
Female	74.6 %	94.8 %

5.4 Major findings and their significance to clinical practice

Almost a quarter of the participants who made medication administration errors (23.1%) never reported their MAEs. On the other hand, 28.6% of participants indicated that they “always” reported their MAEs. Accordingly, MAEs are not reported accurately among nurses in Saudi Arabia hospitals. The findings of this study align with other studies regarding under-reporting of errors in other countries. (Chiang, H-Y et al. 2010; Mrayyan, Shishani & Al-Faouri 2007). For example, findings by Vrbnjak et al. (2016), in a systematic review including two studies in Saudi Arabia about barriers to reporting medication administration errors among nurses, were that the reporting of medication administration errors by nurses occurs in only between 37.4% to 67% of all errors.

5.5 Nurses' perceptions of reporting MAEs

Most of participants strongly agree that all MAEs should be reported. Moreover, the findings of this study are that there is strong agreement that all MAEs must be reported even if they did not harm the patient. Furthermore, respondents also agreed that reporting medication administration errors is a worthy use of nurses' time and that nurses would report a medication administration error even if they were not involved in it. Accordingly, it is assumed that nurses who work in Saudi Arabian hospitals are aware of the importance of reporting MAEs (as reported in Figure 10 in Chapter 4).

Furthermore, the qualitative findings indicated that, the awareness about the importance of reporting MAEs was good as shown by these comments:

“nurses should be knowledgeable enough about MAEs reporting” (participant 281) and, “MAEs should be reported as soon the incident occurs” (participant 358)

Moreover, when asked if any other comments that you think are important about medication administration errors and reporting them, many participants confirmed that the reporting of MAEs is very important and has a positive influence on patient care.

5.6 Potential barriers of reporting MAEs as perceived by nurses

5.6.1 1-Administration Factors:

This section discusses the administration factors which are potential barriers to MAEs.

5.6.1.1 1-1 Fear of punishment

This study examined three potential factors that may inhibit nurses to report their MAEs. Among the three factors, the factors related to nursing administration were found to be the most significant barriers that hinder the reporting of MAEs among nurses in Saudi Arabia. The nurses indicated agreement that the primary administrative barrier was the fear of being punished or blamed by nursing administration when reporting MAEs. Nurses also agreed that the following administrative barriers could discourage reporting: nursing administration may believe that medication administration errors are a measure of the quality of nursing care that the nurse provided, and the response by nursing administration may not match the severity of the medication administration error (i.e. a relatively simple error results in a significant punishment).

These findings are supported by other study in Saudi Arabia (Almutary & Lewis 2012). Furthermore, another study finding in Taiwan found nurses were given unsupportive responses from administrators when reporting MAEs (Chiang, H-Y et al. 2010).

5.6.1.2 1-2 Focus on the individual nurse not system problem

Also, quantitative data shows that most nurses agree that nursing administration would focus on the individual nurse as the primary cause of the medication administration error rather than seeing it as a system problem. Moreover, Stratton et al. (2004) in their study found that nursing administration focuses on the nurse who committed the MAEs as the main cause of the error rather than the system. In addition to that, in this current study, qualitative data, particularly participant number 20 in the open-ended question stated that:

“there was no root cause analysis (RCA) conducted about medication administration errors in this unit”.

5.6.1.3 1-3 No Feedback

Results of qualitative analysis of this study found that, the lack of feedback on reported MAEs was considered a barrier to reporting MAEs. Participant number 204 stated that:

“there is no action from quality department or feedback”.

Moreover, participant number 80 claimed that:

“reporting medication administration error is vital to determine the action needed to fix the medication administration errors but there is no action or feedback taken”.

These findings suggest that a culture of inaction on reported MAEs more likely is existing in these hospitals. Some study findings showed that, MAEs feedback had the strongest positive effect on error reporting for health practitioners (Pham et al. 2011; Richter, McAlearney & Pennell 2014). Thus, administration needs to provide feedback soon after the MAE so that nurses will feel that reporting MAE is taken into account by managers which then lead to improve the MAE reporting (Pham et al. 2011).

5.6.2 Personal Factors

A significant finding of this study is that, there are two items in the personal factors part were the most significant concerns of nurses when reporting their MAEs. These two personal factors were:

1. nurses were concerned about the patient or family may develop a negative attitude toward them with a loss of confidence in their nursing abilities; and
2. nurses were concerned about facing lawsuits or legal action by patient or family.

Similar results in previous studies were also noted that the patients or their family might develop a negative attitude toward nurses or may sue nurses who committed and reported their MAEs (Luk et al. 2008; Mayo & Duncan 2004; Uribe et al. 2002).

Following personal factors, the qualitative data of this study revealed the staff felt they might be seen as a criminal when reporting MAEs as participant number 353 stated:

“please not consider the staff criminal”.

This result confirms findings by other researchers regarding the same issues (Almutary & Lewis 2012). These findings indicate that the blame culture exists in Saudi Arabian hospital settings.

As shown in the results chapter, analysis of variance with post hoc analysis was conducted to identify if there are significant differences between the three age groups and the findings show that the age group above 40 has significantly more negative personal barriers than the other two age groups. However, there is no significant difference between the less than 20 and 25-40 age group. It indicated that this group of nurses (age group above 40) may have experienced little encouragement in an unsupportive work environment when reporting their MAEs. Some other studies found similar results that longer years of nursing practice experience with negative experiences of reporting MAEs could determine the willingness of nurses to report their MAEs (Blegen et al. 2004; Mayo & Duncan 2004).

On the other hand, in this study nurses with less than one year have a significantly more positive perception of personal barriers to reporting MAE than others. Furthermore, nurses with 1-5 years have a significantly more positive perception of personal factors as barriers to reporting MAE than those with >10 years. These findings suggested that the work culture may be changing to a more supportive culture. Dyess and Parker (2012), Clark and Holmes (2007), and Kajander-Unkuri et al. (2014) in their studies found that new nurses considered the work culture and environment as important issues in their care outcomes and correlated positively with their competencies.

5.6.3 Reporting process factors

Interestingly, there were no issues about the reporting process factors. Most participants disagreed with the statement “I would not know how to report a medication administration error if it occurred”. Moreover, neutral was the most common answer by most of the participants when researcher asked them if the incident report forms were too complicated. However, the relatively high SD suggests that the participant’s responses were widely varied. Hence, there is a wide variation of opinion on this question. Similar findings are also supported in a previous study similar to the study performed by Chiang, HY and Pepper (2006). However, only half of the ninety-one responses in this study, who answer (Yes) when researcher asked if they made any MAEs, actually reported their medication administration errors.

The current study results show that there are significant differences between some of the education level groups as follows. The Diploma level nurses have a significantly more negative perception of the reporting process barriers than the bachelor’s and the postgraduate. Whereas, no significant differences between bachelor and post graduate level nurses were found. Although, there are some study findings showing that there was no link between nursing level of education and nurses’ knowledge of reporting MAEs systems (Mayo & Duncan 2004; Sears et al. 2016), other studies indicated that higher education is linked with safer medication administration practice (Simonsen et al. 2014; Stratton et al. 2004; Uribe et al. 2002).

This finding which showed there was no issue with reporting processes factors was unexpected because it was perceived in other studies as being a greater barrier to reporting (Maidment & Thorn 2005; Uribe et al. 2002). Furthermore, the qualitative data of this current study also indicates that the MAE reporting system is an issue that may hinder the reporting of MAEs. Some participants stated that ideally the MAE reporting system should be available, confidential, clear and easy to report. Nurses are willing to report MAEs when they feel that the reporting system is not burdensome or as confidential as it should be, particularly if reporting forms are sent to their manager and then further up the chain (Balas, Scott & Rogers 2004). Thus, the researcher believes that the MAE reporting forms/systems should be re-examined with regard to how such forms are designed.

The current study results showed that nurses with less than one year of experience have a significantly more negative perception of the reporting process as a barrier in reporting

MAEs. Similar explanations correspond to previous investigations reporting systems/forms could be a barrier that affect the willingness of nurses to report MAEs (Chiang, HY & Pepper 2006; Uribe et al. 2002). Moreover, the lack of clinical experience may inhibit nurses to report MAEs. A study found out that inexperienced nurses were less likely to report medication administration errors (Stratton et al. 2004). The other groups have no significant differences between them. Inexperienced nurses were less able to recognize the causes of medication administration errors (Saintsing, Gibson & Pennington 2011).

5.6.4 Causes of MAEs

The causes of MAEs were not the focus of the research. However, the issue was identified by some participants in the open-ended section of the questionnaire. This was a small number of respondents. In the current study, the participants' qualitative data explains this finding. As illustrated by the following statements, under staffing is main cause of MAEs among nurses.

“understaffing is the number one cause of medication administration error”.

“insufficient staffing number is a main cause of MAEs”.

“understaffing is the number one of cause medication administration error”

(participants number 184, 185 and 186 respectively).

Similar in a study in Jordan, the Jordanian nurses indicated that nursing shortage is a significant factor that influence medication administration errors (Mrayyan, Shishani & Al-Faouri 2007). These findings may determine that understaffing nurses in Saudi Arabia is a serious issue that requires an immediate attention.

Another cause of MAEs that raised by one participant in this study was physicians illegible handwriting.

Participant number 234 stated:

“the physicians who write the medication order should be clear”.

Similar findings in another study found that nurses ranked difficulty to read the physician's writing as a number one factor for causing medication administration errors (Mayo & Duncan 2004).

5.7 Application to clinical practice

Based on results of this study and its similarity to other studies, no single or combination of nurse demographic characteristics were significantly associated with nurse perceptions of the MAEs reporting. The current study identified that nurses perceive that MAEs reporting is very important. Accordingly, it is assumed that nurses who work in Saudi Arabian hospitals are aware enough about the importance of reporting MAEs.

This study calls attention to the need for changing the work environment from blame culture to a blame-free culture as this was identified as a significant barrier to reporting MAEs. Participants in this study identified fear of blame or punishment by nursing administration as the primary barrier to MAEs reporting. They also identified the fear of the patient or family might develop a negative attitude toward nurses and may sue them as a strong barrier to report MAEs. This information provides nursing leaders and policy makers with the opportunity to be able to understand what may hinder the reporting of MAE among nurses which then help them to improve the current situation of health environment to support patient safety

Based on results of this study, the research recommends administration take actions to prioritize efforts to improve MAE reporting and increase organizational safety culture. Administration should plan and work on changing the nurses' perception of the risk of reporting MAEs. Therefore, further efforts should be made to encourage a 'no-blame' learning culture within an organization in which the reporting of errors is encouraged and seen as a positive action.

Moreover, as the results of this study show, there is lack of action and feedback from the hospital and nursing administration toward MAEs reporting, the administration of the health organizations in Saudi Arabia should treat all reports seriously and demonstrate a commitment to take actions and provide feedback. These actions and feedback should be provided soon after the error report because delays may affect performance negatively. This action would make nurses more aware about how their reporting of MAEs is important in the process of making improvement.

Finally, the reporting form/system is one of the main influencers of reporting MAEs (Walston, Al-Omar & Al-Mutari 2010). As a result, an existing clear and easy to use MAEs reporting system is recommended in Saudi Arabia health system as a tool to encourage nurses to report their MAEs (Airaksinen et al. 2006). This error reporting system must be

anonymous and confidential, quick and easy to use as possible. Such reporting system will encourage nurses to report their MAEs.

5.8 Limitation

There more female respondents were over-represented (94.8%) in this study. Study should have achieved a more representative balance between males and females.

Secondly, the majority of the nurses who participated in this study, English is their second language. The questionnaire was developed using English language, which may negatively affect the understanding for some participants.

The use of self-reporting questionnaire is believed by many researchers to limit a study due to self-report bias (Adams et al. 1999). The subject of perceived medication administration error occurrence, reporting, and safety culture can be viewed as intrusive and threatening. Nurses may be reluctant to provide information about themselves, their peers, or hospital systems for fear of manager or peer retaliation. While assurance of anonymity was made, participants may still have been reluctant to be honest.

The study was conducted in only one region in Saudi Arabia and thus it could be argued that the region may not be representative of Saudi Arabia more broadly as Saudi Arabia has some variations in culture, geography, and demographics in all regions as discussed in chapter 2. However, there is still similarity between regions in terms of the administration of the health care system by Saudi Ministry of Health for all regions. Although, the three involved study hospitals were similar in terms of certain demographic characteristics, this does not mean the results of this study are generalizable to other hospitals with similar characteristics in Saudi Arabia.

Researcher's bias is a potential limitation as he has worked in one of the involved hospital and being involved in some projects and activities in the other two involved hospitals. As a result, the researcher has an 'insider status', being known to some of these hospitals nurses, managers and stakeholders. Hence, participants even after assurances of anonymity may have been more cautious or guarded in their answers.

5.9 Recommendations for further research

Lack of research into barriers to reporting MAEs among nurses in Saudi Arabia suggests the need for further research and development of safety culture and management approaches to

overcome these barriers. Further research is required also to examine Saudi hospital MAEs reporting policies. Also, further research required to find what non-punitive reporting systems are in place in other countries.

5.10 Conclusion

The reporting of MAEs is an important nursing practice. Nurses as front line staff are in a good position to recognize and report MAEs. MAEs reporting is a useful tool for identifying potential system faults that can contribute to the likelihood of future errors. Thus, MAEs reporting can help to identify and address the potential and actual safety events which can then help prevent future errors. This current study examined nurses' perceptions of reporting medication administration errors. The findings identified that most nurses have a positive perception and good awareness about the importance of reporting MAEs. It also examined the potential barriers to reporting MAEs among nurses in Saudi Arabia. This dimension consists of three parts: personal factors, administration factors and reporting system process.

The key factors that were considered as the main barriers to report MAEs among nurses in Saudi Arabia in this study were the culture of blame and nursing administration.

Thus, the researcher suggest that healthcare organizations leaders and policy makers need to review their policies on MAEs reporting and work towards changing the culture of reporting MAEs and punitive actions to make interventions to develop a non-blaming, non-punitive and non-fearful culture that encourage nurses to report their MAEs and to change and improve the safety culture within the organization. Moreover, this study highlighted the importance of designing confidential, anonymous, clear and effective MAE reporting systems. This study also discussed some causes of MAEs that need to be taken into account such as, the shortage of nursing staff and the illegibility of medication order writing.

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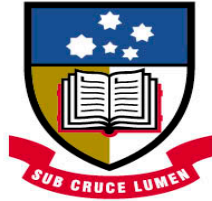
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CHAPTER 6: APPENDICES

6.1 Appendix 1: Questionnaire



THE UNIVERSITY *of* ADELAIDE

Barriers to the reporting of medication administration errors among nurses in Saudi Arabia
Questionnaire

Please complete this short survey. There are no right or wrong answers. Your responses to this survey will help us evaluate the potential barriers that may face nurses when reporting medication administration errors.

All surveys and responses are completely anonymous, confidential and no personally identifiable information will be associated with your responses in any reports generated from the use of this data.

By completing this questionnaire, you are indicating your consent to participate in this study.

PART I Demographics and background

PART II Nurses' perceptions of reporting medication administration errors

PART III Potential barriers to reporting medication incidents

Your response and time to participate in this survey is greatly appreciated.

Thank you

PART I –Demographics and background

Please complete the following background information (circle the appropriate answer)

1. Have been employed in this hospital for 6 months or longer?

- Yes (please continue with the questionnaire)
- No (please don't continue with the questionnaire- thank you for your time)

2. Gender		3. Age			4. Ethnicity			
Male	Female	<25 Years	25-40 Years	>40 Years	Arabian	Asian	Western	Other:
5- Education					6- Years of post-graduate nursing experience			
Diploma/Associated Diploma		Bachelor Degree	Postgraduate		< 1 year	1- 5 years	6-10 years	>10 years
7. In which areas have you predominantly worked whilst practicing as a Nurse (You may circle more than one box)								
Medical wards	Surgical wards	Pediatric wards	Intensive care unit	Emergency department	Dialysis unit	Operation room	Other:	
8. What is your current job position								
Staff nurse		Head nurse		Nursing supervisor		Nursing administration		
9. Have you ever made a medication administration error? (Include: giving wrong drug, delivering by incorrect route, incorrect time, delays or omission/s of medications)								
Yes (Proceed to question 10)					No (Proceed to PART II)			
10. Have you ever reported any medications errors?								
Never (Proceed to PART II)				Mostly			Always	
11. Which way did you mostly use to report medication administration errors?								
Notify nurse in charge		Notify patient's primary physician			Use medication administration error reporting system			

PART II: Perception of Reporting Medication administration errors

Please read the following statements and choose the option that best suits you

Nurse's perception to report medication administration error/s					
Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
When a medication administration error occurs I think it, should be reported?	1	2	3	4	5
I believe that reporting medication administration errors is a worthy use of my time	1	2	3	4	5
I am likely to report a medication administration error even if it did not harm the patient	1	2	3	4	5
I am likely to report a medication administration error only when similar errors have occurred previously in the department	1	2	3	4	5
I would report a medication administration error even if I was not involved in it (for example another nurse on your shift made a medication administration error and you know they did not report)	1	2	3	4	5

PART III: Potential Barriers to Reporting Medication administration errors

Included here are three themes, which may potentially impact your willingness to report medication administration errors. Please read each statement and choose the option that best suits you.

a. Personal Factors

I would be hesitant to report a medication administration error as:					
Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I may be viewed as incompetent by other nurses	1	2	3	4	5

I could be discriminated against by co-workers (e.g. co-workers may question my ability to deliver safe care)	1	2	3	4	5
Other employees in the hospital would become aware of my medication	1	2	3	4	5
I may face repercussions (e.g. salary deductions or contract termination)	1	2	3	4	5
It is possible I may face lawsuit or legal action (patient or family's suing me)	1	2	3	4	5
The patient or family may develop a negative attitude toward me with a loss of confidence in my abilities	1	2	3	4	5

b. Administration Factors

I would be hesitant to report a medication administration error (or would not report my medication administration error) due to a nursing administration concern (for this survey the term 'nursing administration' means Head Nurse, Nursing Supervisor and/or Nursing Director).

Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
If I were to report a medication administration error/s there is a risk that I may be punished by nursing administration. (This may affect my annual performance evaluation or having my contract terminated)	1	2	3	4	5
Nursing administration may believe that medication administration errors are a measure of the quality of nursing care that I provided	1	2	3	4	5
Nursing administration would focus on the individual nurse as the primary cause of the medication administration error rather than seeing it as a system problem (e.g. environmental causes, poor communication)	1	2	3	4	5
The response by nursing administration may not match the severity of the medication administration error (i.e. a relatively simple error results in a significant punishment)	1	2	3	4	5

c. Reporting Processes Factors

I would be hesitant to report a medication administration error (or would not report a medication administration error) because I have concerns about the incident reporting process.

Items	Strongly agree	Agree	Natural	Disagree	Strongly disagree
Incident report forms are too complicated	1	2	3	4	5
Incident reporting takes too much time (e.g. filling out the report, contacting the physician)	1	2	3	4	5
I would not know how to report a medication administration error if it occurred	1	2	3	4	5

The hospital's definition of a medication	1	2	3	4	5
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Please feel free to write any other comments that you think are important about medication administration errors and reporting them or any suggestions that helps in motivating nurses to report medication administration errors?

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Thank you for participating in this survey and please put your completed survey in any secured boxes that placed in the nursing staff rooms or at the signing in/out area (time clocks).

6.2 Appendix 2: Study Authorization

Kingdom of Saudi Arabia
Ministry of Health
Directorate of Health affairs
Assir Region
600 / 275



المملكة العربية السعودية
وزارة الصحة
المديرية العامة للشئون الصحية بمنطقة عسير
٦٠٠ / ٢٧٥

الموضوع :

المشروعات :

التاريخ :

الرقم :

April 25, 2016

To: Whom it may concern

Re: Abdulrahman Albukhodaah

Sub: Permission to use premises

This is certifying that **Mr.** Abdulrahman Albukhodaah, Master student of Nursing science at The University of Adelaide, Australia, is completely authorized and supported to conduct a study on the **Barriers to reporting medication administration errors among nurses in Saudi Arabia**. The study will be conducted at three public hospitals which are:

1. Asir Central Hospital
2. Khamis General Hospital
3. Ahad Rufaidah Hospital

The Directorate General of Health Affairs in Asir is the administrative authority of all hospitals including the three involved hospitals and the primary health care facilities in the whole region.

This document was issued upon the request of **Mr.** Abdulrahman Albukhodaah to confirm our agreement, collaboration and support for this study.

If you have any further enquiries please do not hesitate to contact The Hospitals Management Director in Asir Region Dr Mushabab Al Asmri on email: malasmri@moh.gov.sa

تليفون : ٢٢٤٦٢٤٢ - ص.ب : ٣٨٠٠

6.3 Appendix 3: Ethics Approval



26 May 2016

Mr P McLiesh
School of Nursing

RESEARCH BRANCH
OFFICE OF RESEARCH ETHICS, COMPLIANCE
AND INTEGRITY
THE UNIVERSITY OF ADELAIDE

LEVEL 4, RUNDLE MALL PLAZA
50 RUNDLE MALL
ADELAIDE SA 5000 AUSTRALIA

TELEPHONE +61 8 8313 5137
FACSIMILE +61 8 8313 3700
EMAIL hrec@adelaide.edu.au

CRICOS Provider Number 00123M

Dear Mr McLiesh

PROJECT NO: H-2016-110
Barriers to the reporting of medication administration errors among nurses in Saudi Arabia

The ethics application for the above project has been reviewed by the Office of Research Ethics, Compliance and Integrity's Human Research Ethics Secretariat and is deemed to meet the requirements of the *National Statement on Ethical Conduct in Human Research (2007)* involving no more than low risk for research participants.

The ethics expiry date for this project is: 31 May 2019.

Where possible, participants taking part in the study should be given a copy of the Information Sheet.

Ethics approval is granted for three years and is subject to satisfactory annual reporting. The form titled *Annual Report on Project Status* is to be used when reporting annual progress and project completion and can be downloaded at <http://www.adelaide.edu.au/ethics/human/guidelines/reporting>. Prior to expiry, ethics approval may be extended for a further period.

Where possible, participants in the study are to be given a copy of the Information Sheet and the signed Consent Form to retain. It is also a condition of approval that you **immediately report** anything which might warrant review of ethical approval including:

- serious or unexpected adverse effects on participants,
- previously unforeseen events which might affect continued ethical acceptability of the project,
- proposed changes to the protocol; and
- the project is discontinued before the expected date of completion.

Yours sincerely

Michelle White
Manager
Office of Research Ethics, Compliance and Integrity



THE UNIVERSITY
of ADELAIDE

RESEARCH BRANCH
OFFICE OF RESEARCH ETHICS, COMPLIANCE
AND INTEGRITY
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EMAIL hrec@adelaide.edu.au

CRICOS Provider Number 00123M

Applicant: Mr P McLiesh

School: School of Nursing

Project Title: ***Barriers to the reporting of medication administration errors among nurses in Saudi Arabia***

THE UNIVERSITY OF ADELAIDE HUMAN RESEARCH ETHICS COMMITTEE
Office of Research Ethics, Compliance and Integrity

Project No: H-2016-110 RM No: 0000021702

APPROVED for the period until: **31 May 2019**

Thank you for the modified ethics application dated 23.5.16. It is noted that this study will be conducted by Mr Abdulrahman Albukhodaah, Masters student.

Michelle White
Manager
Office of Research Ethics, Compliance and Integrity

6.4 Appendix 4: Research Approval

Kingdom of Saudi Arabia
Ministry of Health
King Fahad Medical City
(162)



المملكة العربية السعودية
وزارة الصحة
مدينة الملك فهد الطبية
(١٦٢)

IRB Registration Number with KACST, KSA: H-01-R-012
IRB Registration Number with OHRP/NIH, USA: IRB00010471
Approval Number Federal Wide Assurance NIH, USA: FWA00018774

May 16, 2016
IRB Log Number: 16-188E
Department: External
Category of Approval: EXEMPT

Dear Abdulrahman Albukhodaah,

I am pleased to inform you that your submission dated May 10, 2016 for the study titled '**Barriers to reporting medication administration errors among nurses in Saudi Arabia**' was reviewed and was approved. Please note that this approval is from the research ethics perspective only. You will still need to get permission from the head of department or unit in KFMC or an external institution to commence data collection.

We wish you well as you proceed with the study and request you to keep the IRB informed of the progress on a regular basis, using the IRB log number shown above.

Please be advised that regulations require that you submit a progress report on your research every 6 months. You are also required to submit any manuscript resulting from this research for approval by IRB before submission to journals for publication.

As a researcher you are required to have current and valid certification on protection human research subjects that can be obtained by taking a short online course at the US NIH site or the Saudi NCBE site followed by a multiple choice test. Please submit your current and valid certificate for our records. Failure to submit this certificate shall a reason for suspension of your research project.

If you have any further questions feel free to contact me.

Sincerely yours,

Prof. Omar H. Kasule
Chairman Institutional Review Board--IRB.
King Fahad Medical City, Riyadh, KSA.
Tel: + 966 1 288 9999 Ext. 26913
E-mail: okasule@kfmc.med.sa



6.5 Appendix 5: Recruitment Notice



NURSES NEEDED FOR RESEARCH

We are looking for nurses to take part in a study of :
(Barriers to the reporting of medication administration errors (MAE) among nurses in Saudi Arabia).

Research Project:

The aim of this study is to provide helpful information on the MAE reporting practice and assist in the development of a medication administration policy and organisational guidelines to aid nurses in maintaining safety while administering medication in Saudi Arabia.

Part of my master thesis in nursing science

Approved by Human Research Ethics Committee (HREC) at the University of Adelaide and the General Directorate for Research and Studies at the Ministry of Health in Saudi Arabia

Procedure:

- participation is completely voluntary
- As a participant in this study, you would be asked to answer a short hard copy questionnaire
- Only Seven to ten minutes for survey completion
- No personal information will be disclosed
- Anonymity and confidentiality will be strictly mentioned.
- No risks are anticipated from the study

Any Question?

If you are willing to participate in the study, or have any question related to the project, feel free to contact the researcher:

Abdurahman Albukhodaah
The University of Adelaide
Phone No (KSA) 00966503066330
Email: a1674020@student.adelaide.edu.au



6.6 Appendix 6: Participant Information Sheet



THE UNIVERSITY of ADELAIDE

PARTICIPANT INFORMATION SHEET

PROJECT TITLE: Barriers to the reporting of medication administration errors among nurses in Saudi Arabia

HUMAN RESEARCH ETHICS COMMITTEE APPROVAL NUMBER:	
PRINCIPAL INVESTIGATOR:	Paul McIlesh
STUDENT RESEARCHER:	Abdulrahman
STUDENT'S DEGREE:	Masters

Dear participant,

It is our pleasure to invite you to complete a short survey in the research project described below.

What is the project about?

This study is titled "Barriers to the reporting of medication administration errors among nurses in Saudi Arabia". The overall aim of this study is to highlight the potential barriers or challenges that may contribute to the failure of reporting medication administration errors among nurses in Saudi Arabia. As you know nurses always placed on the front line when medication administration errors occur because nurses administer the vast majority of medications ordered in hospitals.

Your kind participation is highly appreciated.

Who is undertaking the project?

Abdulrahman Albukhodaah will conduct this project, as it will form the basis for the Master's degree in Nursing Science at the University of Adelaide in Australia under the supervision of Paul McIlesh and Iain Everett.

Why am I being invited to participate?

All nursing staff at Asir Central Hospital, Khamis General Hospital and Ahad Rufaidah Hospital who are involved in medication administration practices are invited to be part of this survey. Your participation is entirely voluntary.

What will I be asked to do?

You are asked to answer a short hard copy questionnaire. All questions are about the Barriers to the reporting of medication administration errors among nurses in Saudi Arabia and you will not be asked to disclose any personal information. The questionnaire contains three parts only: first part will be about participant's demographic data and background (11 items); second part will be about participant's perception to report MAE (5 item); and the third part will be the potential barriers to reporting MAEs that are classified as (a) personal fear factor (6 items), (b) administration factors (4 items), and (c) reporting processes factor (4 items). Most of these parts will use a five point Likert scale that include (Strongly agree - agree - Neither agree nor disagree - disagree - Strongly disagree) or frequency rating such as : (1) never (2) sometimes (3) always. There will also be 2 open-ended questions at the end of the questionnaire. Please be assured that your anonymity is ensured, no identifying information will be collected and the demographic data section will not be presented in a way that may be used to identify you. By completing this questionnaire, you are indicating your consent to participate in this study

How much time will the project take?

The time you may spend to complete this survey will range from 5 to 10 minutes and includes space for your suggestions.

Are there any risks associated with participating in this project?

There are no any expected risks associated with participating in this project. However, the anticipated burden on you by participating in this study is the time you spend in answering the questionnaire may be an issue for you. Thus, research will provide you a week period of time to answer this questionnaire according to your free time. Furthermore, if you feel any distressed during participating in this study for any reason, please be advised that you can visit a social worker at your hospital on (Level xx, Office number xx, phone number 00966xxxxxxxx). You will be anonymous and no one will be able to identify you at any stage of this study including the research team members because no identifying information will be collected.

What are the benefits of the research project?

The results of this research may provide helpful information on medication administration error reporting practice and assist in the development of medication administration policy and organizational guidelines to maintain nurses' safety practice while administering medication in Saudi Arabia.

Can I withdraw from the project?

Participation in this project is completely voluntary. If you agree to participate, you can withdraw from the study at any time without it affecting you in any way. However, please be advised that your information cannot be withdrawn once they are submitted, because you are anonymous and no one will be able to identify your information. You are free to answer or ignore the questionnaire without any implications.

What will happen to my information?

Members of the research team will only access the anonymous responses. A statistician at the University of Adelaide may also have access to the data to assist or provide advice on the quantitative analysis. Your information will be saved based on the policy of the University of Adelaide for five years at which time it will be shredded.

Who do I contact if I have questions about the project?

For more information or details about the study do not hesitate to contact:

Paul McLiesh (Lecturer)

Ph.: [+61 8 8313 6286](tel:+61883136286)

Fax : [+61 8 8313 3594](tel:+61883133594)

email: paul.mcliesh@adelaide.edu.au

www.health.adelaide.edu.au/nursing

Mr. Iain Everett (Lecturer)

Email: iain.everett@adelaide.edu.au

Telephone: 08-8313-0267

Abdulrahman Albukhodaah

Student researcher, School of Nursing

Email: a1674020@student.adelaide.edu.au

Mobile phone:

What if I have a complaint or any concerns?

The study has been approved by the Human Research Ethics Committee at the University of Adelaide in Australia (approval number). If you have questions or problems associated with the practical aspects of your participation in the project, or wish to raise a concern or complaint about the project, then you should consult the Principal Investigator. Contact the Human Research Ethics Committee's Secretariat on phone +61 8 8313 6028 or by email to hrec@adelaide.edu.au. If you wish to speak with an independent person regarding concerns or a complaint, the University's policy on research involving human participants, or your rights as a participant. Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome.

If I want to participate, what do I do?

If you are interested to participate in this research, just fill out the short questionnaire.

Yours sincerely,

Paul Mcliesh

Iain Everett

Abdulrahman Albukhodaah

6.7 Appendix 7: Study Instrument Communication

The screenshot shows a Gmail interface in a Chrome browser window. The address bar displays the URL: <https://mail.google.com/mail/u/1/#search/hayfa.almutary%40student.qut.edu.au/153e49d10ee84d17>. The email header shows it is from Abdulrahman Albukhodaah <a1674020@student.adelaide.edu.au> to Hayfa Hamed A Al Mutary, dated 5 Apr. The email body contains the following text:

Dear Hayfa,

My name is Abdul. I am currently a nursing master student at Adelaide University in Australia. I am going to do my research this year and I am interested in medication errors reporting. Thus, I would like to thank you for the helpful study that you have conducted about **Nurses' Willingness to Report Medication Administration Errors in Saudi Arabia**. I would like also to ask you to send me the questionnaire that you have designed, so that I can use it in my study.

Best Regards
Abdul
0061402206205
Adelaide University

The reply email is from Hayfa Hamed A Al Mutary to Abdulrahman Albukhodaah, dated 5 Apr. The email body contains the following text:

Dear Albukhodaah,

It is good to know that you are interested in investigating this issue that significantly impact on clinical practice and patients safety. Please find the attachment for the instrument. You may add some information or make some modifications in demographic part based on your research purposes.

Good luck in your research.

Best regards
Hayfa Almutary
PhD, School of Nursing, Queensland University of Technology
Lecturer, School of Nursing, King Abdulaziz University

The email footer shows the following details:

From: Abdulrahman Albukhodaah [mailto:a1674020@student.adelaide.edu.au]
Sent: Tuesday, 5 April 2016 2:10 PM
To: Hayfa Hamed A Al Mutary
Subject: a structured questionnaire