

## Clinicians' perception of issues in patient safety: A case study of public hospitals in Riyadh region, in Saudi Arabia

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### Abstract

*Although delivery of healthcare services has improved significantly, the number of serious medical errors continues to rise. For instance, 30,000 patients in the UK die every year because of medical errors. In Saudi Arabia, with a much smaller population base, the number of medical errors reported every year is around 8,000 (20% of complaints received by the Ministry of Health). This research aimed to determine the perceptions of clinicians regarding risk factors that undermine patient safety in the hospitals run by Ministry of Health, in Riyadh region.*

*A cross-sectional survey using self-administered questionnaires. Cluster sampling was used to select ten hospitals in Riyadh region. The questionnaires were distributed to 774 physicians working in ten randomly selected hospitals. The overall response rate was 61% (n=470), of which 449 questionnaires (58%) contained complete information on key variables and were valid for analysis (58% response rate).*

*Results showed the top ten factors perceived as risks to patient safety were: shortage of medical staff, low level of patient education, lack of patient compliance, overcrowding of patients, concealment of personal information by patients, long working hours, poor coordination between hospital departments, insufficient continuous medical education and training, shortage of medical supplies, and shortage of drugs. Results also revealed that commitment by hospital managers to patient safety was perceived to be low, and there were limited opportunities for training programs on patient safety.*

*Patient safety was perceived by physicians working in selected MOH hospitals to be affected by a combination of system, human and patient-level risk factors. Eliminating risk factors, improving training programs in patient safety, and ensuring commitment by top-level management are essential to enhance patient safety in hospitals run by the Ministry of Health. The implications of the study findings for future research are discussed.*

### Introduction

The desired outcome of medical care is to provide effective treatment. However, undesirable outcomes, namely adverse events and medical errors do occur during provision of medical care. Although the terms 'adverse events' and 'medical errors' are often used interchangeably, there are differences in application and consequences of these concepts. An adverse event is 'an injury caused by medical management rather than the underlying disease or condition of the patient' (Aspden et al. 2004:201). Medical errors are considered to be 'preventable adverse events' (Khon, Corrigan & Donaldson 2000).

The focus of this paper is on patient safety issues in relation to medical errors. Although the occurrence of medical errors is not a new phenomenon, it has become a focus of systematic study after the publication of the seminal report in United States in 1999 by the Institute of Medicine titled "To Err Is Human: Building a Safer Health System" (Donaldson 2004:1). Consequently, the WHO established the World Alliance for Patient Safety (WAPS), to 'galvanize and coordinate global and national efforts to improve patient safety' (Donaldson 2005:30). Six main strategies were adopted by the WAPS to enhance patient safety across the world; 'global patient safety challenge, patients for patient safety, taxonomy for patient safety, research for patient safety, solutions for patient safety, reporting and learning' (Pittet & Donaldson 2005:892).

According to Donaldson and Philip (2004:892), medical errors and adverse events affect 10% of patients during healthcare provision in the developed countries. In the US, between 44,000 to 98,000 patients die every year because of incidents of medical errors, which exceeds the number of death due to motor vehicle accidents, breast cancer, and AIDS (Khon, Corrigan &

Donaldson 2000:26). In the UK, one in 10 hospitalized patients suffers from an adverse event. The rate of adverse events is 16.6 percent in New Zealand, Canada, and Australia (Donaldson 2005:30). However, the problem of preventable medical errors is not restricted to western nations and as stated by Plianbangchange (2006) 'patient safety is a global problem which affects rich and poor countries alike'. In fact the extent of medical errors in the developing countries is greater than in the developed ones (Vincent 2006:53). Although it is difficult to ascertain the exact number of preventable adverse events, there are millions of people in developing countries who receive sub-standard treatment and are exposed to medical errors through poor infection control, use of unsafe medical treatment or treatment by poorly trained medical staff (Donaldson 2005:30).

The focus of this paper is on medical errors in Saudi Arabia. The Saudi Ministry of Health (MOH) receives 40,000 complaints about incidents of medical errors every year. After further investigations, 20% (8000 cases) of these complaints are proven to be as a result of medical errors (Alharbi 2007). According to a study conducted by Alomar and Alfawzan (2005), implementation of patient safety measures in the Saudi public hospitals is poor compared to the private hospitals.

The aims of the present research were to: 1) to determine potential risk factors that threaten patient safety, 2), identify weaknesses in patient safety measures, and 3) explore the culture of patient safety in the MOH hospitals in Saudi Arabia.

## Methods

The current study employed a descriptive quantitative design. A cross-sectional survey was used to investigate the aims of the study. Due to time and other logistical constraints, the study was limited to hospitals in Riyadh region of Saudi Arabia. The target population was 2377 clinicians (physicians) working in 40 hospitals in Riyadh region. Cluster sampling was used as the main sampling strategy (Schofield 2006:35). Ten hospital clusters were randomly selected for the study. A total of 774 questionnaires were distributed to all clinicians in the ten selected hospitals. The overall response rate was 61% (n=470); however, 21 questionnaires were discarded because they were incomplete. The remaining, 449 forms were valid for analysis, yielding a final response rate of 58%.

After reviewing a wide range of literature in the field of quality and safety in healthcare and consultations with a group of healthcare professionals and researchers, a self-administered questionnaire was developed as the main data collection instrument. The questionnaire consisted of three parts. *Part 1* included demographic information. *Part 2* comprised perceptions about risk factors in the MOH hospitals. Three dimensions were included in part 2; system factors, patient factors, and human factors. Patient factors included in the questionnaire were:

### Shortage of medical staff

- Long working hours
- Lack of clinical practice standards and guidelines
- Poor coordination between hospital departments
- Shortage of medical supplies
- Overcrowding of patients
- Outdated medical equipments
- Shortage of drugs
- Poor financial incentives
- Poor design of the hospital structure
- Insufficient continuous medical education and training
- Punitive and blaming environment

Patient factors included in the questionnaire were:

- Concealment of personal information
- Lack of patient compliance
- Patients' low education
- Language differences between patients and physicians

Human factors included in the questionnaire were:

- Poor teamwork among medical staff
- Lack of awareness about hand hygiene among medical staff
- Negligence of medical staff
- Misdiagnosis by physicians
- Unqualified medical staff
- Miscommunication among medical staff

Three options were provided for quantifying the risk associated with each factor: (1) exists (2) somewhat exists (3) does not exist. An open-ended question was added at the end of part 2 to give the respondents an opportunity of including any other risk factor that was not mentioned in the questionnaire. In *part 3*, the Patient Safety Management System (PSMS) model was used to identify the reliability of patient safety culture measures and determine the weaknesses that may affect negatively patient safety in the MOH hospitals. The PSMS model was adopted by the Australian Council for Safety and Quality in Health Care as an effective tool to assess the reliability of patient safety measures in hospitals (Bruce et al. n.d.:11-27). The rationale of using the PSMS model in the present study was that it covers key aspects of patient safety that should exist in hospitals. These include:

- Top-level management commitment to patient safety
- Policies and procedures related to patient safety
- Clearly defined accountability arrangements
- Identification and investigation of patient safety risks
- Availability of systematic approach to manage all resources of patient safety risk
- Evaluating the effectiveness of patient safety program
- Training and educating medical staff in patient safety

Fifteen statements were included in part 3 of the study questionnaire, which required responses on a five-point Likert scale; (1) strongly disagree (2) disagree (3) not sure (4) agree and (5) strongly agree. At the end of part 3 of the questionnaire, another open-ended question was added to allow for any additional suggestions or comments that the respondents might like to include for improving patient safety.

### *Validity and reliability*

The questionnaire was reviewed by six researchers, unrelated to the discipline of safety and quality, at the University of New England. Several revisions were undertaken based on expert opinion to enhance the face validity of the questionnaire. The revised questionnaire was pre-tested (pilot study) on a group of five clinicians, 13 pharmacists, three nurses, and two technicians to assess the content validity and ensure that the questionnaire covered major risk factors which could be associated with medical errors and key aspects of patient safety measures. Cronbach's alpha was used to measure the reliability of the risk factors scale (0.86), and the patient safety measures scale (0.81).

### *Data collection and analysis*

Data were collected over three months from December 2007 to February 2008. An Information Sheet was provided with each questionnaire, which contained information on the

nature and purpose of the research. The voluntary nature of the research project was emphasised and participants were informed that they had the right to withdraw from the study at any stage of the research project. Ethics approval was granted by the Human Research Ethics Committee of the University of New England and Medical Research Committee based in the Ministry of Health in Saudi Arabia.

Data were entered and analysed using the software Statistical Package for Social Science (SPSS) for Windows. The preliminary analysis focused on demographic characteristics of the respondents, identify of the risk factors associated with medical errors, and description of the available patient safety measures in the MOH hospitals, in Riyadh region. Risk factors reported by the study sample were ranked using Friedman two-way analysis of variance rank test (Bryman & Cramer 1999:141). Mann-Whitney U test was used to test for significant differences in the two groups of independent variables in relation to risk factors and patient safety measures (Conover 1980:229). In addition, Kruskal-Wallis One Way Analysis of Variance of Ranks test was used to test for significant differences in three or more groups of the independent variables in relation to risk factors and patient safety measures (Shelley 1984:527).

## Results

### Sample profile

Demographic information of the respondents is provided in Figure 1. Approximately 40% of the respondents were aged between 30 and 39 years, and two-thirds (68.2%) of the participating respondents were male physicians. Most of the respondents (76.8%) were non-Saudi physicians, whereas Saudi physicians constituted 23.2% of the study sample. Over half of the sample (54.1%) comprised specialists, while consultants and residents comprised 23.2% and 22.7% of the sample respectively. Commensurate with their professional grade, nearly two-thirds of the respondents (61.5%) had over 10 years of professional experience.

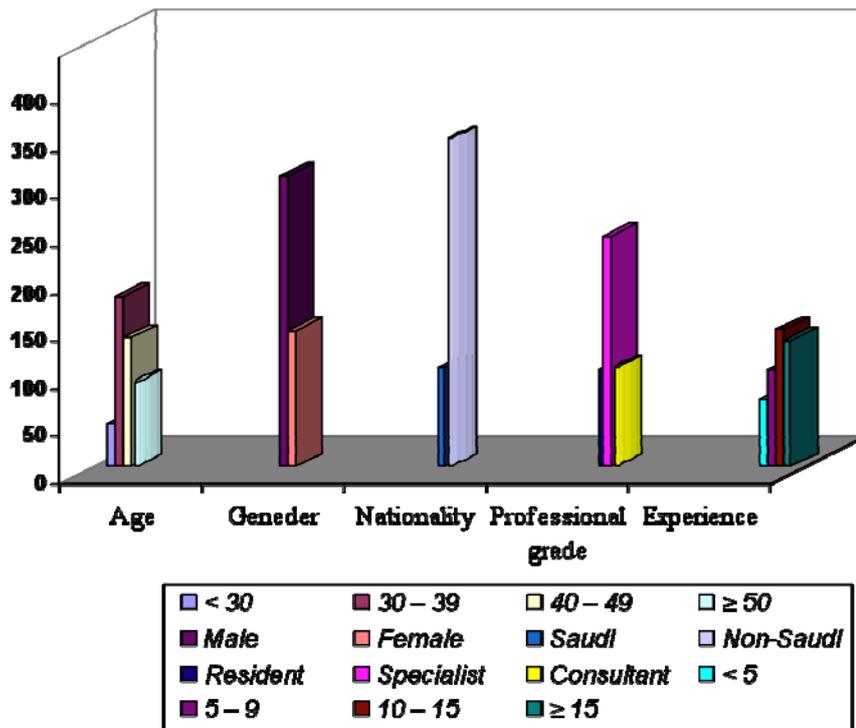


Figure 1: Respondents' characteristics

### Risk factors

A list of 22 risk factors was provided to the participants to quantify the presence of risk factors in their clinical/institutional settings. Participants were asked to choose one of the following options: does not exist; somewhat exists; and exists. Table 1 illustrates the frequency distribution of the risk factors according to the study sample responses. Results show that the top ten factors which were perceived to risk patient safety in the MOH hospitals were: 'shortage of medical staff', 'low level of patient education', 'lack of patient compliance', 'overcrowding of patients', 'concealment of personal information by patients', 'long working hours', 'poor coordination between hospital departments', 'insufficient continuous medical education and training', 'shortage of medical supplies', and 'shortage of drugs'. However in terms of mean rank scores, other risk factors such as language barriers between physicians and patients, poor team work, a punitive and blaming environment and unqualified medical staff also had mean scores that were close to the those listed in the second half of the top ten list. A full list of the 22 risk factors ordered according to mean rank scores is provided in Table 2.

Table 1: Frequency distribution of the risk factors

	Risk factor	Does not exist		Somewhat exists		Exists	
		n	%	n	%	n	%
<b>System Factors</b>	Shortage of medical staff	60	13.4	137	30.5	252	56.1
	Long working hours	105	23.4	165	36.7	179	39.9
	Lack of clinical practice standards and guidelines	167	37.2	138	30.7	144	32.1
	Poor coordination between hospital departments	111	24.7	153	34.1	185	41.2
	Shortage of medical supplies	118	26.3	158	35.2	173	38.5
	Overcrowding of patients	90	20.0	141	31.4	218	48.6
	Outdated medical equipments	185	41.2	151	33.6	113	25.2
	Shortage of drugs	118	26.3	168	37.4	163	36.3
	Poor financial incentives	150	33.4	155	34.5	144	32.1
	Poor design of the hospital structure	169	37.6	130	29.0	150	33.4
	Insufficient continuous medical education	124	27.6	136	30.3	189	42.1
Punitive and blaming environment	127	28.3	186	41.4	136	30.3	
<b>Patient factors</b>	Concealment of personal information	82	18.3	184	41.0	183	40.8
	Lack of patient compliance	56	12.5	172	38.3	221	49.2
	Patients' low education	54	12.0	163	36.3	232	51.7
	Language differences	133	29.6	168	37.4	148	33.0
<b>Human factors</b>	Poor teamwork among medical staff	146	32.5	143	31.8	160	35.6
	Lack of awareness about hand hygiene	221	49.2	119	26.5	109	24.3
	Negligence of medical staff	212	47.2	111	24.7	126	28.1
	Misdiagnosis by physicians	186	41.4	141	31.4	122	27.2
	Unqualified medical staff	171	38.1	112	24.9	166	37.0
	Miscommunication among medical staff	142	31.6	170	37.9	137	30.5

Table 2: Ranking of risk factors

<b>Rank</b>	<b>Risk factor</b>	<b>Mean rank</b>
1 <sup>st</sup>	Shortage of medical staff	14.19
2 <sup>nd</sup>	Patients' low education	13.91
3 <sup>rd</sup>	Lack of patient compliance	13.66
4 <sup>th</sup>	Overcrowding of patients	13.14
5 <sup>th</sup>	Concealment of personal information	12.54
6 <sup>th</sup>	Long working hours	12.18
7 <sup>th</sup>	Poor coordination between hospital departments	12.10
8 <sup>th</sup>	Insufficient continuous medical education and training	12.02
9 <sup>th</sup>	Shortage of medical supplies	11.91
10 <sup>th</sup>	Shortage of drugs	11.74
11 <sup>th</sup>	Language differences between patients and physicians	11.43
12 <sup>th</sup>	Poor teamwork among medical staff	11.13
13 <sup>th</sup>	Punitive and blaming environment	11.01
14 <sup>th</sup>	Unqualified medical staff	10.95
15 <sup>th</sup>	Miscommunication among medical staff	10.75
16 <sup>th</sup>	Poor financial incentives	10.68
17 <sup>th</sup>	Poor design of the hospital structure	10.66
18 <sup>th</sup>	Lack of clinical practice standards and guidelines	10.51
19 <sup>th</sup>	Misdiagnosis by physicians	9.95
20 <sup>th</sup>	Outdated medical equipments	9.67
21 <sup>st</sup>	Negligence of medical staff	9.52
22 <sup>nd</sup>	Lack of awareness about hand hygiene among medical staff	9.16

Chi-square = 597.526

(df) = 21

P-value &lt; .000

### *Patient safety measures*

As mentioned in the methods section, there are seven key dimensions to patient safety measures as outlined by the PSMS model. Results for the present study showed that there were weaknesses in the MOH hospitals in the following patient safety measures: 'top-level management commitment to patient safety', and 'training and education in patient safety'. Most of the respondents disagreed with the statements related to the dimension of 'patient safety training programs'. Furthermore, participants' responses varied considerably to statements relating to the dimension of 'top-level management commitment to patient safety' (see Table 3).

. Furthermore, participants' responses varied considerably to statements relating to the dimension of 'top-level management commitment to patient safety' (see Table 3).

PSMS dimension	Patient safety measure	Strongly disagree		Disagree		Not sure		Agree		Strongly agree	
		n	%	n	%	N	%	n	%	n	%
Top-level management commitment to patient safety	The hospital management has demonstrated commitment and concern to patient safety	103	22.9	94	20.9	54	12.0	153	34.1	45	10.0
	The hospital management supports employees to participate in patient safety activities	92	20.5	106	23.6	58	12.9	148	33.0	45	10.0
Policies and procedures related to patient safety	There are clear policies and procedures about patient safety	38	8.5	83	18.5	53	11.8	179	39.9	96	21.4
	There are policies and procedures for reporting adverse events and incidents	27	6.0	58	12.9	88	19.6	208	46.3	68	15.1
Clearly defined accountability arrangements	There are clearly defined accountability arrangements for patient safety	20	4.5	63	14.0	116	25.8	189	42.1	61	13.6
	Medical staff is aware of their responsibilities with regard to patient safety	15	3.3	52	11.6	77	17.1	181	40.3	124	27.6
Identification and investigation of patient safety risks	There is a systematic approach to identify and investigate patient safety risks	30	6.7	73	16.3	62	13.8	190	42.3	94	20.9
	Employees are encouraged to report any hazards to patient safety	21	4.7	59	13.1	71	15.8	228	50.8	70	15.6
	Patients' complaints about issues of patient safety are taken into account	15	3.3	22	4.9	80	17.8	217	48.3	115	25.6
systematic approach to manage all resources of risk	There is a systematic approach to control all sources of patient risk	16	3.6	39	8.7	105	23.4	212	47.2	77	17.1
	If patient safety risk is identified, immediate actions are taken to eliminate that risk	13	2.9	35	7.8	51	11.4	204	45.4	146	32.5
Evaluation the effectiveness of patient safety program	There are regular evaluations of patient safety measures	30	6.7	77	17.1	103	22.9	163	36.3	76	16.9
	Employees are encouraged to participate in the evaluation process of patient safety measures	32	7.1	81	18.0	106	23.6	189	42.1	41	9.1
Patient safety training programs	There are on-going training programs about patient safety in the hospital	106	23.6	150	33.4	78	17.4	90	20.0	25	5.6
	Employees are encouraged to attend patient safety training programs	103	22.9	130	29.0	79	17.6	101	22.5	36	8.0

Table 3: Frequency distribution of the patient safety measures

## Discussion

Patient safety has become a predominant theme for all stakeholders in healthcare delivery (McClanahan, Goodwin & Houser 2000:4). Poor quality and safety measures in Middle Eastern countries have been associated with increase in unnecessary costs, lack of social trust, inefficient healthcare services, and increase in malpractice lawsuits (Khoja 2006).

As stated earlier, risk factors associated with medical errors include system factors; human factors and patient factors. The contribution of the system factors for medical errors is underpinned by the systems theory. Systems theory predicates that individuals make mistakes because of defects in the system (Leape 2005 cited in Lachman 2008:134). Similarly, Moss (2003:1) argues that patient safety is violated predominately because of imperfect systems not because of imperfect people. The findings of the present study show that a number of system factors were perceived as risk factors for patient safety. These include shortage of medical staff, overcrowding of patients, long working hours, poor coordination between hospital departments, shortage of medical supplies and/or drugs, and insufficient continuous medical education and training (see Table 1).

Patient factors identified in the literature include miscommunication with healthcare workers due to language differences (Bruce et al. n.d.:8; Loeb & Chang 2003:38; Vincent 2006:107), low education (Alomar & Alfawzan 2005), hiding of personal information, and lack of compliance with the medical staff instructions. The results of the present study show that similar patient-level risks were perceived by physicians to be negatively influencing patient safety in public hospitals in Riyadh region of Saudi Arabia. Among the top five risk factors, low education level of patients, lack of patient compliance and concealment of patient information were ranked as second, third and fifth most important factors (see Table 2).

According to Shapiro et al. (2002:329), 70% of medical errors incidents are linked of human factors. Certain factors adversely affect the ability of healthcare professionals, such as poor teamwork and miscommunication among medical staff. Al-Doghaither et al. (2001) concluded from their research conducted in the Saudi hospitals that communication between physicians and nurses in Saudi hospitals was weak and that further improvements were needed to enhance the communication. The present study found that similar concerns about miscommunication among medical staff, poor teamwork, and poor coordination among hospital departments were reported by participating physicians who work in the MOH hospitals in Saudi Arabia.

Bruce et al. (n.d.:5) argue that improving patient safety in a healthcare organization is a shared effort among healthcare workers along with patients in order to identify and rectify the flaws in the system. That is, in order to enhance patient safety and reduce medical errors, all stakeholders should cooperate with each other and form a strong working relationship (Kumar & Subramanian 1998 cited in McFadden, Stock & Gowen 2006:125). The Australian Council for Safety and Quality in Health Care adopted the Patient Safety Management System (PSMS) model as an effective tool to assess the reliability of patient safety in hospitals by exploring the culture of patient safety and identifying factors that may hinder improvements in patient safety (Bruce et al. n.d.:11-27). The results of the present study show a general trend towards agreement with four of the seven dimensions of PSMS model. For example, the study respondents stated that within their MOH hospitals there were 'policies and procedures related to patient safety'; 'presence of clearly defined accountability arrangements'; a process for 'identification and investigation of patient safety risks'; 'availability of systematic approach to manage all sources of risks to patient safety'; and processes to 'evaluate the effectiveness of patient safety measures'. However, the respondents were unsure about the 'commitment of top-level management to ensuring patient safety'. Furthermore, the respondents stated that there were 'no adequate educational and training programs on patient safety'.

The present study was limited to a survey of physicians' perceptions of issues in patient safety in select hospitals in Riyadh region of Saudi Arabia. Within the resource and time constraints of doctoral candidature, it was not feasible to undertake a

complementary qualitative study that explored in more depth some of the issues around the culture of patient safety. Furthermore, while physicians are important stakeholders in ensuring patient safety, there are other healthcare workers in hospital settings who also are involved in patient safety. These include nurses, technicians and other allied health staff. Their perception of risks to patient safety can be different from physicians. A future study that looks at the perceptions of all healthcare workers involved in direct care as well as top-level management may provide a more comprehensive picture.

## Summary

Medical errors are increasingly being recognised as a major impediment to improving quality and safety of services for hospitalised patients. The Ministry of Health in Saudi Arabia is the largest provider of hospital services. The present study focused on identification of perceptions of risk factors for patient safety amongst a sample of physicians working in the Ministry of Health hospitals in Riyadh region of Saudi Arabia. Preliminary analysis of study data showed that patient safety was perceived to be influenced by a combination of system, human and patient-level factors. The PSMS model of patient safety was found to be useful in further mapping the various dimensions of patient safety. The present study provides useful information to pilot strategies to minimise risks to patient safety. Future research that encompasses the views of key stakeholders both clinical and senior managerial staff would be valuable in developing appropriate strategies to improve patient safety in public hospitals in Saudi Arabia.

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