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Patient Safety in Saudi Hospitals: Assessment of Provider Perceptions

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The Institute of Medicine (IOM) report "To Err is Human: Building a Safer Health System," made patient safety a hot issue (in USA) among providers, patients, purchasers, payers, decision makers, and the media; the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has recently approved 2003 National Patient safety Goals ⁽¹⁾. There has been a considerable interest in improving patient safety since the release of some major reports in the USA ^(2&3), the UK, and Australia ⁽⁴⁾. To address this issue, healthcare providers and professionals must collaborate in identifying the factors risking patient safety in Saudi health hospitals for the sake of increasing the level of patient safety. Because most of the

current evidence on adverse events come from hospitals (risks associated with hospital services are high), this study aims at achieving the following objectives:

- (1) To determine how staff perceive the implementation of Patient safety in Saudi hospitals.
- (2) To determine differences among Saudi Ministry of Health (MOH) hospitals and private hospitals regarding patient safety implementation.
- (3) To find out the variables risking patient safety in Saudi hospitals.
- (4) To determine the relation between respondents' socio-demographic variables and their perceptions towards patient safety implementation.

Literature Review

Theoretical Framework

The influential goal of healthcare organizations has a marvelous potential to benefit patients and the healthcare team by accepting the fact that putting substantial energy and skills into developing the culture if safety is a crucial issue in the process of healthcare provision⁽⁵⁾.

Safety, as the corner stone of quality, is defined as “*freedom from accidental injury.*” Though measurement and assessment of patient-care quality has been a motivating force in the healthcare sector for several decades, medical error is still one of the leading causes of death⁽⁶⁾.

Patient safety necessitates leaders who are educated, accountable, alert, and directly involved. Patient safety is the main strategy of the health care organization that requires involvement. It is the delivery of harm-free care to people⁽⁷⁾.

This concept of patient safety has many different definitions--each being defined by research context. Generally, patient safety is related to the idea that patients in

health care organizations are getting the desired results ⁽⁸⁾. Patient safety is also defined by the Institute of Medicine's (IOM's) as "*freedom from accidental injury due to medical care, or medical errors.*" A more recent IOM report defined medical errors as "*the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim...[including] problems in practice, products, procedures, and systems.*" ⁽⁹⁾; this definition of IOM has since been expanded to include "*the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim. Errors can include problems in practice, products, procedures, and systems*" ⁽¹⁰⁾. According to the Institute of Medicine, "*the biggest challenge to moving toward a safer health system is changing the culture from one of blaming individuals for errors to one in which errors are treated not as personal failures, but as opportunities to improve the system and prevent harm.*" ⁽¹¹⁾.

The significance of searching and studying errors in promoting patient safety has been investigated in three reports from the Institute of Medicine (IOM). The first was "To Err is Human" which outlines the importance of knowing about "what, why, and how" the error occurred. The report also offers a full review of error reporting

systems and how they positively or negatively influence patient safety plans. The second report was "Crossing the Quality Chasm" ⁽¹²⁾, which reflect the necessity of redesigning healthcare to improve patient safety. Among the suggestions is appropriate utilization of information systems technology. The third report was "Keeping Patients Safe", which reviews patient safety from the aspect of the work environment, including the structures and processes healthcare staff uses. A key concept in this report is the promotion of an organizational safety culture or environment, recognizing that safety-oriented cultures are created by 3 factors: organizational environment/processes, staff perceptions and attitudes, and individual safety-related behaviors ⁽¹³⁾.

The second IOM report, *Crossing the Quality Chasm*, also stressed that the "non-system" in which patients see many healthcare providers, in many healthcare organizations, with no complete information, influences the quality and safety of health care. The same report indicates that many types of "process errors" have been attributed to this "non-system," including medication errors, administrative mistakes, treatment delivery problems, and miscommunication ⁽¹²⁾.

The JCAHO has just released its 2007 National Patient Safety Goals. Such goals include⁽¹⁴⁾:

- Improve the accuracy of patient identification.
- Improve the effectiveness of communication among caregivers.
- Improve the safety of using medications.
- Reduce the risk of health care-associated infections.
- Accurately and completely reconcile medications across the continuum of care.
- Reduce the risk of patient harm resulting from falls.
- Encourage patients' active involvement in their own care as a patient safety strategy.
- The organization identifies safety risks inherent in its patient population [Applicable to psychiatric hospitals and patients being treated for emotional or behavioral disorders in general hospitals.]

Previous Studies

A retrospective screening and review of 15,000 admissions to 28 USA hospitals, conducted in 2000, showed

that about 3% of hospitalizations resulted in an adverse event, 0.2% involved an adverse event resulting in death, and 30% of all adverse events were judged as negligent. Such damage is attributed to the complex mix of procedures, technologies, and personal interactions that forms the provision process of health services⁽¹⁵⁾. Another study conducted in Colorado and Utah showed that the incidence of overall adverse events and preventable adverse events was related to the complicatedness of the patients' conditions⁽¹⁶⁾. Therefore, safety is a very important principle of patient care and a critical element of healthcare quality. Only recently, the medical world realized the significance of ensuring patient safety^(2&3). Patient safety is seen as an important issue for the American public and health care delivery systems⁽¹⁷⁾.

The IOM report, "To Err is Human," identifies patient safety as "freedom from unintentional injury and error as the failure of a planned action to be completed as planned (error in implementation) or the implementation of incorrect plan to accomplish an aim; that is, error in planning⁽¹⁸⁾". Patient safety is also seen as subset of medical errors, which in turn are subset of gaps in quality. Gaps in quality are a part of

poor caring; such large problems need rational prioritization, which requires policy and medical decision makers to avoid narrow-minded and take a global perspective in studying such large problems ⁽¹⁹⁾. To some extent, patient safety is an imprecise concept to many, therefore, there is a need for a simple conceptual framework so that patient-safety categorized as an important component of risk management, clinical governance, and quality improvement ⁽²⁰⁾.

The IOM report indicated that between 44000 and 98000 patients die yearly (in USA) due to medical mistakes, which make medical mistakes the 8th top cause of death; total annual national costs emerging from medical mistakes are anticipated to be between \$38 and \$50 billion. The IOM came up with the following three recommendations. The first was the formation of a Center for Patient safety in the Agency for Healthcare Research and Quality (AHRQ), the second was the creation of a national compulsory reporting system for adverse events that cause serious injury or death. The third was supporting the idea of developing voluntary reporting systems for acquiring information about less serious adverse events, with protection of reported

information⁽²¹⁾.

The National Patient safety Foundation (NPSF) organized a focus group encompassing professional nurses to address issues related to reducing errors in the health field. They discussed issues like barriers to reporting and resolving errors, breaking down the barriers, education and training. The focus group recommended the creation of a web-based patient-safety education module for nurses to raise knowledge related to these issues⁽²²⁾. A study, conducted in USA (2001), concluded that a safer healthcare requires safer systems, and that healthcare quality control must focus on systems not persons, on improvement not blame⁽²³⁾. In other study, type of hospital ownership was found to be associated with preventable adverse events⁽²⁴⁾. A study conducted to examine healthcare provider perceptions of patient safety indicated that the organization's characteristics that influence patient safety include regulatory/legal, financial, staffing, internal environment, patient and provider attributes, patient and provider education, and communication⁽¹⁾. The Academy of Canadian Executive Nurses accomplished a survey to examine Canadian nurses' perceptions of patient safety; the sample consisted of 503

nurses from 22 Academic Health Science Centers. Nurses in this study answered that healthcare organizational environment presents escalating risk to their patient safety; specifically, workload, nursing shortage, human resources, restructuring (Bed closures), customers, systems matters, physical environment and technology (specialization) were factors highlighted as causes of risking patient safety⁽²⁵⁾. In another study, conducted in (2003), the authors mentioned that approaches to patient safety must concentrate on the hidden errors, which correspond to the malfunction of system design and processes; systems must be redesigned in a way to prevent, detect and minimize effects of undesirable results⁽²⁶⁾.

Patient safety in Saudi Arabia

Currently little information exists on the magnitude of the patient safety in Saudi Arabia. However, assuming that 10% of acute admissions involve some sort of adverse event, the numbers of people affected in the country can be estimated as 10.7% of the populations of Saudi Arabia annually are admitted as inpatients to health facilities. Therefore, working on the basis that at least 10% of all

inpatient incidents result in unintended harm, this represents a significant number of people affected by patient harm in Saudi Arabia ⁽²⁷⁾. Recently, patient safety is getting more concern in Saudi Arabia. The media in recent years raised the issue of medical errors that caused many people to lose their lives or get injured. The International Patient Safety Summit conducted in Riyadh 2006 was the first of its kind related to patient safety in Saudi Arabia. In this summit, the Saudi Health minister told participants that the MOH intends to require all expatriate doctors to undergo a screening process to ensure that they are qualified to practice medicine. He also revealed that there are plans to create a nationwide body that would be responsible for ascertaining the qualifications of non-Saudi physicians who come to work in the country. As a result of this Summit, a set of recommendations was approved concentrating on the creation of a national centre for patient safety, the creation of national reporting and adverse event notification systems, strategies to boost patient safety awareness among staff and national plan for continuing professional education concentrating on patient safety ⁽²⁸⁾.

In a study conducted in Riyadh city to investigate the factors risking patient safety in governmental (military,

teaching and MOH) and private hospitals, it was found that hospitals varied in their execution of patient safety procedures; showing that private hospitals implement more patient safety procedures than the MOH hospitals. The study also revealed that the top ten factors risking patients' safety in all Saudi hospitals included in the study include medical staff work stress, human errors, recruiting unqualified staff, lack of regular training, patients' low level of education, miscommunication among medical staff, miscommunication between patients and medical staff, shortage of necessary supplies, lack of quality healthcare standards, and finally the inappropriate documentation ⁽²⁹⁾. Such results might be explained by another study conducted in Riyadh city in 2007; in which the author found that the MOH hospitals were significantly the least among all hospitals in creating what is called patient safety culture. In addition, a study investigating the medication prescribing errors in Saudi hospitals showed that the overall incidence of prescribing errors in the private hospitals was significantly less than that in the governmental hospitals ⁽³⁰⁾. Finally, a study searched the factors threatening dental patient safety in Saudi Arabian health settings found that the teaching health settings scored the highest overall rank in

dental patient safety and the least mean value was scored by the MOH sector. The study showed that low level of patient education, high work load, work stress, miscommunication, lack of dental preventive programs, lack of regular training and continuing programs, poor reporting system, not implementing healthcare quality standards, insufficient dental staff, and poor infection control system were the main factors risking dental patient safety in the MOH settings⁽³¹⁾.

From the above it can be concluded that patient safety is now of significant concern in Saudi Arabia. Generally speaking, previous studies found that the MOH hospitals were the least in creating patient safety culture and therefore their patients' safety is not assured. On the other hand studies revealed that private patients' are safer than the MOH patients.

Methodology

Population and Sample

The target population of this study included all hospital doctors, nurses, pharmacists, quality staff, specialists, and technicians working in both MOH and private hospitals in Riyadh city. To represent the target population properly, a stratified random sampling was used to represent the two sectors (MOH and private). The sample size was determined by using the equation ($n=p(1-p)Z^2/e^2$) using the portion of targeted population (p) as 50%, the standardized value as $Z=1.96$ and the accepted error (e) as 0.05⁽³²⁾; this equation yielded that the required sample size was 384. A questionnaire was developed and 500 questionnaires were distributed to three hospitals in each sector based on the number of staff in each hospital (300 to the MOH and 200 to the private hospitals). A follow up letter was sent to remind selected people to respond to questionnaires. Of the 500 questionnaires 350 were valid for analysis (70 %).

The instrument

The study instrument consists of two parts. The first part was designed for the demographic information of the respondents: hospital ownership, occupation, gender, experience, and age. The Second part included variables jeopardizing patient safety in hospitals. In addition, subjects were asked a question to reflect the perception about the extent to which patient safety is implemented in these hospitals. Scale used in the questionnaire was the five-point likert scale (Strongly disagree= 1, disagree= 2, not sure =3, agree= 4, and strongly agree= 5). For those whose mother language is not Arabic, an English version of the questionnaire was available.

Validity and Reliability

For the purpose of validity the questionnaire was given to three academicians specialized in health and hospital administration and their suggestions were taken into consideration. In addition, a pilot study of 13 hospital staff (not included in the main study) was conducted, and their suggestions and comments were also taken into

consideration in developing the final draft of the questionnaire. The reliability of the questionnaire was measured using the coefficient alpha; it was 95 %.

Results and Discussion

The respondents' characteristics are included in table 1 and table 2. The majority of respondents were nurses (28.3%), females (51%) and from the MOH (65.7). On average respondents have 10 years of experience ($SD = \pm 7$ years) and the age mean was about 34 years ($SD = \pm 8.3$ years).

Table (1)**Socio-demographic characteristics of respondents
(n=350)**

Variable	Frequency	%
Occupation		
Physician	79	22.6%
Nurse	99	28.3%
Specialist	69	19.7%
Technician	45	12.9%
Quality staff	27	7.7%
Pharmacist	31	8.8%
Gender		
Male	172	49.0%
Female	178	51.0%
Sector		
MOH	230	65.7%
Private	120	34.3%

Table (2)**Age and experience of respondents**

Variable	Mean	SD
EXPERIEN	10.01	7.09
AGE	34.44	8.30

Table 3 showed the results of two-independent samples t-test, such results indicated a significant difference between respondents' perceptions regarding the implementation of patient safety due to the sector they belong to. Results pointed out that the overall mean of the responses from the private sector regarding the implementation level of patient safety was significantly higher than the overall mean of the responses from the MOH hospitals (4.27 vs. 3.58, $t=7.83$ and $p<0.01$). This result goes along with general conclusion of most of the previous studies in which they concluded that the patient safety in private hospitals was significantly better than patient safety in the MOH hospitals. Such result is expected since previous research showed that the MOH hospitals were the least in providing patient safety culture among its medical and health staff.

Table (3)**Results of t-test for differences between respondents' perceptions regarding the implementation of patient safety due sectors**

Sector	Mean	SD	t-Value	P-value
1) Private	4.27	0.73	7.83	0.004
2) MOH	3.58	0.87		

Results of the Analysis of variance (ANOVA) in table 4 revealed that there is a significant difference between respondents, in their perception towards the implementation of patient safety, due to their occupations. Scheffe test showed that the overall mean of nurses' and pharmacists' responses are significantly higher than that of specialists (4.15 and 4.14 vs. 3.60, $F=2.33$ and $p<0.05$). That is, nurses and pharmacists think that the implementation of patient safety measures is significantly higher than what the specialists think. However, the ANOVA test did not reveal any significant differences between the remaining occupations concerning the level of patient safety implementation.

Table (4)

ANOVA results for differences between respondents' perceptions towards the implementation of patient safety due to type of job

Occupation	Mean	SD	F-Value	p-value	Sig. Difference between
1) Quality staff	3.94	0.84	2.33	0.040	(3) and (5)
2) Physicians	3.89	0.88			(4) and (5)
3) Nurses	4.15	0.73			
4) Pharmacists	4.14	0.84			
5) Specialists	3.60	0.75			
6) Technicians	3.88	0.77			

To test if there is a significant difference between males and females concerning their view about the implementation of patient safety in their health organizations t-test was utilized. The results are included in table (5) showed that females believe that patient safety is implemented in their hospital; such believe is significantly higher than that

reflected by males ($t=-2.77$ and $p<0.01$). In addition, Pearson correlation (see table 6) showed that the more experienced the respondent is, the higher perception of the implementation of patient safety ($r=0.23$ and $p<0.05$). Yet, the correlation did not show a significant relationship between respondents' age and their perception towards patient safety implementation in their hospitals ($p>0.05$).

Table (5)

Results of t-test for differences between respondents' perceptions regarding the implementation of patient safety due gender

Variable	Mean	SD	t-value	p-value
Gender				
Male	3.76	0.95	-2.77	0.005
Female	4.04	0.98		

Table (6)

Correlation coefficients between respondents' perceptions and their age and experience

		Age	Exp.
Extent of patient safety implementation	r	0.11	0.23
	p-value	0.06	0.04

Variables risking patient safety in hospitals

Respondents from the MOH agreed that there were 24 variables (mean is greater than 3.40) risking patient safety in their hospitals. The top ten variables risking patient safety (see Table 7) included the lack of regular equipment maintenance as the first or the most important cause of risking patient safety. Next cause was the lack of new technologies such as the drug ordering system and the computerized charting system. Shortage of necessary supplies came as the third cause negatively influence the patient safety at the MOH hospitals. The next two significant causes risking patient safety were the employment of unqualified staff and the absence of regular

training of the MOH hospital staff. All the five causes could be related to the improper allocation of financial resources. The next five causes according to the MOH hospital respondents were the medical staff work-stress, not implementing quality health care standards, low patients' educational level, absence of effective infection control system, and the improper investigation and suing system (in case of medical staff errors). The last cause, coupled with the absence of health care quality standards and ineffective infection control system, may induce secrecy and silence in the MOH system, which is opposing the fact that high quality institutions should learn from their mistakes to improve their performance.

Table (7)**Factors risking patient safety at MOH hospitals**

Factor	Mean (SD)
1- Lack of regular equipment maintenance.	4.00 (1.08)
2- Lack of new technologies (i.e. Drug ordering system, computerized charting system).	3.99 (1.26)
3- Shortage of necessary supplies (i.e. Drugs, needles...etc.).	3.94 (1.24)
4- Employing unqualified staff.	3.92 (1.28)
5- Lack of regular training of staff.	3.88 (1.05)
6- Medical staff work related stress.	3.88 (1.17)
7- Not implementing quality health care standards.	3.87 (1.01)
8- Low educational level of patient.	3.86 (1.04)
9- Absence of effective infection control system.	3.79 (1.19)
10- Improper investigation and suing system incase of medical staff errors	3.78 (1.08)

Table (8), on the other hand, showed that respondents from the private hospitals reported 20 variables risking patient safety in their hospitals. The top ten variables risking patient safety in their hospitals encompass the medical staff work-stress as the first cause. Then, the miscommunication among medical staff, human errors, miscommunication between patient and medical staff, low educational level of patient, employing unqualified staff, specific cultural or traditional behaviors of the society, lack of regular training of staff, the improper documentation system, and the influence of personal relationship when dealing with patient (favoritism).

Table (8)**Factors risking patient safety in private hospitals**

Causes	Mean (SD)
1- Medical staff work related stress.	4.00 (1.02)
2- Miscommunication among medical staff.	3.90 (1.07)
3- Human errors (either from patient or staff).	3.86 (0.89)
4- Miscommunication between patient and medical staff (i.e. Language).	3.86 (1.07)
5- Low educational level of patient.	3.84 (1.04)
6- Employing unqualified staff.	3.75 (1.29)
7- Lack of regular training of staff.	3.70 (1.17)
8- Improper documentation.	3.67 (1.12)
9- Improper error reporting systems between hospitals.	3.51 (1.29)
10- Denial of disease due to social reasons (i.e. Psychiatric patients and mentally or physically retarded patients).	3.50 (1.17)

These above results matches to a great extent the results of the previous studies investigated factors risking patient and dental patient safety in Saudi healthcare settings.

Conclusion and Recommendations

Results showed that hospitals vary in their implementation of patient safety measures. It also revealed the existence of various variables risking patient safety in Saudi hospitals. Indeed, the improvement of patient safety demands a complex system-wide effort in both sectors, including continuous quality improvement in all aspects of performance, environmental safety and risk management and prevention (including infection control at the MOH), utilization management, including safe utilization of medicines and equipment, updating and proper maintenance of medical equipment, and safe clinical practice. This effort must involve all hospitals' regulations and players, which need a comprehensive approach to detect and hence manage all current and potential variables or causes risking patient safety in health settings in Saudi Arabia.

Both sectors must start the improvement by paying particular attention to the top 10 causes in each sector in order to increase patient safety levels in Saudi hospitals. According to results, this study suggests the following recommendations:

1) It is very important that all hospitals look at patient safety as a comprehensive system that requires attention to all its components, rather than providing individual solutions to a narrower aspects of a specific patient safety problem. As one suggested; "If we truly want safer care, we will have to design safer systems"⁽³³⁾.

2) To enhance patient safety, Saudi hospitals need to concentrate on three procedures or levels. The first is concerned with preventing variables risking patient safety from occurring. The second is concerned with making such variables noticeable. The third is to alleviate their consequences when they occur. To do so, hospitals need to improve their healthcare quality by: improving their error and incidents reporting systems (to learn from failures), improving their data collection system and data measurement and analysis to determine significant causes risking patient safety and to be better able to predict mistakes and weaknesses that may risk patient safety. They also need to increase and improve the current knowledge resources (more appropriate training sessions; especially in the epidemiology of adverse events), and to use high standards to employ sufficient high quality medical and

non-medical staff to reduce work load and hence work stress. In addition infection control systems need to be strictly implemented with higher level of documentation. Such issues are extremely important for both MOH and private hospitals.

(3) With the growing interest in patient safety and the implementation of cooperative health insurance in the Kingdom, it is the time for decision makers at the Saudi MOH to create a national commission or authority for ensuring the implementation of hospital quality accreditation standards that enhance patient safety in Saudi health organizations. In addition, such standards need to necessitate that patients be told about unexpected outcomes in their treatment programs. It is known that multiple factors may prevent doctors from disclosing medical errors; such factors may include fear of malpractice suit, damage doctor's reputation, and being embarrassed and uncomfortable⁽³⁴⁾. However, failure to inform patients about errors may damage patients' confidence and satisfaction, and malpractice suit. We must remember that patients' confidence and satisfaction as well as malpractice suit will be among the central issues in the Saudi health system with

the full implementation of cooperative health insurance.

Discloser of errors needs a very high level of communication skills among doctors due to the fact that the interaction between the patient who experienced the medical error and his/her doctor is a significant factor of patient reaction to a medical error.

References

- (1) Hansen, Mary M, Durbin, Jonathan, Sinkowitz-Cochran, Ronda, Vaughn, A, Langowski, Maary, and Gleason, S. "Do No Harm: Provider Perceptions of Patient safety". *J of Nursing Admin*, 2003; vol. 33 (10): 507-508.
- (2) Kohn LT, Corrigan JM, Donaldson MS, eds. *To err is human. Building a safer health system*. Washington, DC: National Academy Press, 1999.
- (3) Wilson T, Pringle M, and Sheikh A. "Promoting patient safety in primary care: Research, action, and leadership are required". *BMJ*, 2001; vol. 323: 583-584.
- (4) Runciman WB, Edmonds, MJ, Pradhan, M. "Setting priorities for patient safety". *Quality & Safety in Health care*, 2002; vol. 11: 224-229.

- (5) Nicklin, Wendy. "Patient safety: Springboard to Nursing Accountability". *Can J Nurs Leadersh*, 2003; vol. 16 (4): **66-68**.
- (6) Mary B Thomas and Susan Houston. "Theoretical Approaches for Investigating Patient Safety". **The Journal for Advanced Nursing Practice**; (May/June 2005). Vol 19 (3), PP. 129-134.
- (7) Julianne M. Morath. "Patient Safety: A View From the Top". **Pediatric Clinics of North America**, Volume 53 • Number 6 • December 2006.
- (8) P. S. Romano, J. J. Geppert, Sheryl Davies, Marlene R. Miller, Anne Elixhauser and Kathryn M. McDonald. (2003). **A National Profile of Patient Safety In U.S. Hospitals**. *Health Affairs*, 22, no. 2: 154-166.
- (9) Revard, P. E., Elwy, A. R., Susan Loveland, Zhao, S., Tsilimingras, D., Anne Elixhauser, Romano, P. S. and Emy Rosen. Applying Patient Safety Indicators

(PSIs) Across Health Care systems: Achieving Data Comparability." **Advances in Patient Safety**; Vol. 2: pp. 7-25.

- (10) V F Nieva and J Sorra. (2003). Safety culture assessment: a tool for improving patient safety in healthcare organizations. *Qua. Saf Health Care* 2003; p. 12.
- (11) Institute of Medicine. **Crossing the Quality Chasm: A New Health System for the 21st Century.** Washington, DC: National Academy Press; 2001.
- (12) Institute of Medicine. **Keeping Patients Safe: Transforming the Work Environment of Nurses.** Washington, DC: National Academy Press; 2003.
- (13) Ed Quality Solutions. "ED Quality News: 2007 National Patient Safety Goals. http://www.ed-quality.com/EmergencyMedicine_News/ED_News_2007_JCAHO_Patient. Visited on 15/3/2007.

- (14) Management Effectiveness Initiatives. Patient safety. <http://www.emro.who.int/mei/PatientSafety.htm>
- (15) Thomas, EJ, Studdert, DM, Burstin, HR, Orav EJ, Zeena T, Williams EJ, et al. "Incidence and types of events and negligent care in Utah and Colorado". *Med Care*, 2000; vol. 38 (3): 261-271.
- (16) Espinosa, JA, and Nolan, TW. "Reducing errors made by emergency physicians in interpreting radiographs: Longitudinal study". *BMJ*, 2000; vol. 320: 737-740.
- (17) Silver, Micheael R. and Lusk, R. "Patient safety: A Tale of two Systems". *Journ Nurs Care Qual* 2002; 16 (3): 24-35.
- (18) Maddox, PJ, Wakefield, Mary and Bull, Jan. "Patient safety and the Need for Professional and Educational Change". *Nursing Outlook*, 2001; vol. 49 (1): 8-13.

- (19) Woolf, SH. "Patient safety is not enough: targeting quality improvements to optimize the health of the population". *Ann Intern Med*, 2004; vol. 140 (1): 33-36.
- (20) Runciman WB. "Lessons from the Australian Patient safety Foundation: Setting up a national patient safety surveillance system—is this the right model?" *Quality & Safety in Health care*, 2002; vol. 11:246-251.
- (21) Shuren, AW. "Health Care Delivery Errors: Patient safety Falls Prey to Politics". *J Pediatr Health Care*, 2001; vol. 15: 42-44.
- (22) Sokol, Patricia, Cummins, Deborah S. "A Needs Assessment for Patient safety Education: Focusing on the Nursing Perspective". *Nursing Economics*, 2002; vol. 20 (5): 245-248.

- (23) Cullen, DJ, Bates, DW, and Leape, LL. "Prevention of Adverse drug Events: A Decade of Progress in Patient safety". *J of Clinical Anesthesia*, 2001; vol. 12: 600-614.
- (24) Thomas, EJ, Orav, EJ, and Brennan, TA. "Hospital ownership and preventable adverse events". *Int J Health Serv.*, 2000; vol 30 (4): 745-761.
- (25) Nicklin W, McVeety, JE. "Canadian Nurses' Percetions of Patient safety in Hospitals". *Can J Nurs Leadersh.*, 2002; vol. 15 (3): 11-21.
- (26) Anandh, RT, and Agarwal, AK. "Medical Errors and Patient safety". *JAHA*, 2003; vol. 15 (1): 15-21.
- (27) WHO. International Patient Safety Summit (IPPS).
[http://www.who.int/patientsafety/
events/06/IPPS/en/index.html](http://www.who.int/patientsafety/events/06/IPPS/en/index.html). Visited on 15/3/2007.

- (28) Alomar BA. Factors risking patient safety in Saudi hospitals. **Egypt. J. Biomed. Sci.** 2004, Vol. 15 (July): 465-479.
- (29) Al-Mutairi F. (2007). **Patient Safety Culture in Riyadh hospitals.** Unpublished Mqaster research project. King Saud University, Riyadh.
- (30) Al-khani, Salma. (2007). **Medication Prescribing Errors in Saudi Hospitals.** Unpublished Mqaster research project. King Saud University, Riyadh.
- (31) Al-Anazey, M. R. (2007). **Factors Risking Dental Patient Safety in Riyadh City, Saudi Arabia.** Unpublished Mqaster research project. King Saud University, Riyadh.
- (32) Al-Assaf, AF. (1993). Data Management for Total Quality. In Al-Assaf, AF. And June A. Schmele (editors). **The Textbook of Total Quality in Healthcare.** Delray Beach, St. Luice Press.

- (33) Berwik, DM, Leape LL. "Reducing errors in medicine". *BMJ* 1999; vol. 319: 136-137.
- (34) Thomas H. Gallagher, Amy D. Waterman, Alison G. Ebers; Victoria J. Fraser, Wendy Levinson. "Patients' and Physicians' Attitudes Regarding the Disclosure of Medical Errors". *JAMA*. 2003; 289: 1001-1007.

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