The Knowledge, Attitude and Practice of Physicians and Nurses toward Adverse Event Reporting System in Primary Health Care Setting

Mohammad Alboliteeh[1]* (PhD); Ibrahim Mohammed Almughim[2] (MSc)

1. Vice Dean for Graduate Studies and Research, College of Nursing, University of Hail, Kingdom of Saudi Arabia.
2. Quality Coordinator, National Guard Hospital, Riyadh, Kingdom of Saudi Arabia.

A R T I C L E I N F O	A B S T R A C T
Article type: Original Article **Article history:** Received: 05- Nov-2016 Accepted: 26-Nov-2016 **Keywords:** NGHA Nurses Physicians OVA	**Introduction:** This study aimed to determine knowledge, attitude and practice of physicians and nurses toward the use of Occurrence Variance Reporting system (OVR) in order to improve patient safety. **Materials and Methods:** This quantitative research with descriptive design was conducted on Primary Healthcare (PHC) physicians and nurses, working at National Guard Health Affairs (NGHA), Saudi Arabia. A hard copy of the survey was distributed to two Primary Care Centers, including Yarmook and Khashim ala'an. **Results:** In this study, the majority of physicians and nurses (89.5%) had a good knowledge of OVR application. However, knowledge level was higher in the nurses, compared to the physicians (94% versus 53.6%), and they had a better practice level of the OVR system (82.1% versus 52.4%). In other words, physicians were more likely to have negative attitude toward the OVR system, compared to nurses (71.4% versus 42.9%). A significant difference was observed between the KAP of physicians and nurses toward the OVR system and other variables, including nationality, language and working site. **Conclusion:** This was the first survey to assess the KAP of nurses and physicians toward the use of OVR system in Saudi Arabia. Apparently, 6% of the participants were not aware of the existing OVR system. According to the results of this study, nurses had better knowledge and practice and less negative attitude toward the system, compared to the physicians.

Introduction

The National Guard Health Affairs (NGHA) of the Kingdom of Saudi Arabia is a semi-governmental healthcare institution, functioning under the supervision of the Kingdom's Ministry of Health. The aim of this healthcare center (established for more than 20 years) has been making significant efforts to improve the quality of healthcare in this country.

To do so, one of the methods is to ensure the availability of adequate opportunities for continuous education and skill promotion for all employees, which will lead to enhanced patient care delivery.

Aside from its basic tenet, this organization has continually pursued national and international accreditation in order to maintain and enhance its service quality.

In order to achieve this goal, a set of international standards has been designed to fit the culture of Saudi Arabia and sustain the safety of patients through the creation of a safe working environment using the Occurrence Variance Reporting system (OVR).

The NGHA consists of four large hospitals in four cities of Saudi Arabia, namely the "King Abdulaziz Medical City" in Riyadh, the "King Abdulaziz Medical City" in Jeddah, the "Imam Abdulrahman bin Faisal Hospital" in Dammam and the "King Abdulaziz Hospital" in Al Hassa [1]. Moreover, there are 23 Primary Healthcare Centers (PHCC) and one university all under the supervision of NGHA (NGHA, 2010). The efforts of this organization have been recognized by some international accrediting bodies, such as the famous Joint Commission International (JCI).

This organization confirmed the standards of the NGHA to correspond with its qualifications and indicators, thus deserving to be recognized by JCI in December 2006. The accreditation included all NGHA hospitals within the kingdom (NGHA, 2010).

*Corresponding Author: Mohammad Alboliteeh, Vice Dean for Graduate Studies and Research, College of Nursing, University of Hail, Kingdom of Saudi Arabia. Email: dr.alboliteeh1@gmail.com

Among all the NGHA hospitals, the largest hospital is "King Abdulaziz Medical City" (KAMC) in Riyadh, which is the capital city of Saudi Arabia, with a bed capacity of 690 beds [1]. In addition, this hospital is recognized as one of the best trauma care centers in the Kingdom. Its emergency care center is ranked fourth outside the United States, and there are approximately 17 PHCCs located throughout Riyadh that support KAMC (NGHA 2010).

Researchers understand the need to create a workflow on the reporting of salient events in a hospital, which is especially considered as world class in terms of services and facilities. Therefore, it is undoubtedly significant that the OVR system presented in NGHA hospitals be maximized to support the need for an effective and efficient healthcare system. With this background in mind, the researchers felt the urgency to determine the knowledge, attitude and practice of physicians and nurses in these NGHA hospitals toward the OVR system. According to the results, it could be an impetus for activities geared towards updating, developing further and providing more information through professional discourse to physicians and nurses to facilitate education and complete awareness toward the OVR system.

Materials and Methods

This cross-sectional study was conducted with a descriptive design. The Nursing Research Textbook authors, Polit & Beck (2004), defined data collection as the gathering of information needed to address a research problem [2]. On the other hand, De Vaus (2001, p.9) highlighted that a cross-sectional design of research aims to ensure that the evidence obtained by researchers will enable them to answer the initial questions as clearly and coherent as possible. For this study, there were primary questions, including "what do physicians and nurses know about the OVR system?"; "what do physicians and nurses feel when they report an incident using the OVR system?" and third "do physicians and nurses know how to apply the OVR system?". With respect to these primary questions, researchers aimed to determine the impacts of knowledge, attitude and practice of physicians and nurses on the application of the OVR system, which will enable them to improve this system and contribute to patient safety among PHCCs under the National Guard Health Affairs (NGHA) in Riyadh, Saudi Arabia.

Despite the fact that many research instruments have been tested and used in various studies on the topic of reporting systems, our researchers developed a questionnaire for the purpose of learning in order to properly answer and determine the responses of the participants to the objectives of this study. To develop this questionnaire, different sources were used, consisting of four elements, as follows: a) demographic characteristics; b) knowledge questions; c) attitude questions and d) practice questions. One of the primary

advantages of the KAP questionnaire was explained by Kaliyaperumal (1994, p.8), arguing that "KAP study tells us what people know about certain things, how they feel and also how they behave". This can be beneficial in assessing the environment before conducting or planning an improvement project in the organization [3]. In addition, the World Health Organization (2008) stated that "a KAP survey is a representative study of a specific population to collect information on what is known, believed and done in relation to a particular topic".

Various parts of the questionnaire were developed through a process. The first part, which is the knowledge variable, was developed based on the policies and procedures of NGHA (NGHA, 2010) and the OVR form was used during the process.

Subsequently, the participants were asked the following questions: a) how many copies are there in the OVR form?; b) are date, time, and location included on the form?; c) should the OVR be completed even if there is a failure of patient care equipment?; and d) what is the purpose of the OVR? Please explain?

All of the items are yes-no questions, with the exception of the last item. The first two questions measured the level of knowledge, whereas the other two aimed to determine the knowledge of the participants about the OVR system.

The second part of the questionnaire referred to the variable of attitude. Data was collected from the literature and experiences of the researcher as an OVR coordinator in one of the NGHA PHC centers.

Participants were presented with the following prompts and were asked to indicate their agreement, disagreement or uncertainty: a) I have inadequate time to write an OVR; b) my colleagues will hate me if I issue OVR against them; c) writing OVR against me will affect my reputation among my colleagues; d) writing OVR against me will affect my annual evaluation; e) those who use OVR are troublemakers.

The questions for the "attitude" towards OVR aimed to measure how the physicians and nurses feel if they report or have reported using the OVR system. The third part of the questionnaire was allocated to the "practice" variable of the participants. This part was developed from the policy and procedure manuals of the OVR system (NGHA, 2010). The participants were presented with the following items and were asked to indicate their agreement, disagreement or uncertainty.

The items of this section include: a) I would be more able to use the OVR form if it were written in Arabic; b) I had an occurrence, variance, or accident happen during my shift, but I did not report it through OVR; c) I am confused about how to fill in the form; it's a confusing form; d) I follow the process after filling an OVR form, starting with my supervisor and e) I have the ability to independently fill the OVR without any assistance. The main purpose of practice items is to test the ability of physicians and nurses in using the OVR system.

Validity and reliability of the instrument. As defined by Aboshaiqah (2010, 72), "validity is the extent to which an instrument reflects the concept being examined. On the other hand, reliability refers to the instrument measuring what it is intended to measure." Individual-focused interviews were conducted with two nurses and three physicians with research background from one of the NGHA PHCCs to develop the instrument [5]. To establish the validity and reliability of the instrument, Dr. Saeed Alrahma, the head of the research unit in the Family Medicine Department of NGHA, was contacted for feedbacks on the initial draft of the instrument. Afterwards, the instrument was pretested on three nurses and physicians to ensure that the questions measure what they were intend to assess. Furthermore, the reliability of the instrument was calculated at the Cronbach's alphas of 0.58, 0.61 and 0.55 for the items related to the variables of knowledge, attitude and practice, respectively. In the Cronbach's alpha rule, the results or score should be around or greater than 0.60 to establish the validity of the instrument (Kaneg et al. 2006, cited in Aboshaiqah, 2010).

When the validity of the instrument was successfully established, the questionnaires were distributed and then collated. These processes were carried out from 24th of November 2010 to 4th of December 2010 in four main primary healthcare centers in NGHA, Riyadh city, which is the main locale of the study. In this study, inclusion criteria were being a physician or nurse, working at Yarmook and Khashim ala'an PHC centers at the time of the research and adequate English language knowledge to understand, speak and write since the official language of NGHA was only provided in English.

After subject selection, the researchers distributed the questionnaires by following the succeeding steps: a) initial contacts were made directly to each primary healthcare center director for a courtesy call and explaining the purpose of the study; b) memorandums were delivered to the secretaries of the physicians and nurse mangers from the director's office; c) for the nurses, each questionnaire was coded according to their mailbox number, whereas the questionnaires were coded according to the clinic number for the physicians and the initial of each working site was beside each code and d) after the distribution of the questionnaires among the subjects, the medical secretaries and nurse managers in each PHCC were contacted by the researchers to inquire if the questionnaires were ready to be collected. Furthermore, the secretaries and nurse managers in the mentioned two PHC centers were encouraged to make a follow-up of the unreturned questionnaires.

Table1: Population Characteristics

Characteristics		Frequency Distribution	Percentage Distribution
Gender	Male	19	17%
	Female	93	83%
Total		112	100%
Nationality	Saudi	8	7.1%
	Non- Saudi	33	29.5%
	Non-Arab	71	63.4%
Total		112	100%
Language	Arabic Speaking	42	37.5%
	Non-arab speaking	70	62.5%
Total		112	100%
Profession	Nurse	84	75%
	Physician	24	25%
Total		112	100%
Working Site	Yarmook PHC	76	67.9%
	Khashimala'an PHC	36	32.1%
Total		112	100%

Table2: Knowledge Questions on OVA Reporting System

Questions	Correct Answers	Wrong Answers
1. How many copies are included in the OVA form?	97 (92.4%)	7 (6.7%)
2. Are time, date and location included in the form?	100 (95.2%)	5 (4.8%)
3. Should the OVA be completed even if there is a failure of direct patient care equipment?	98 (93.3%)	7 (6.7%)
4. The purpose of OVA	60 (57.1%)	45 (42.9%)

Table3: Age Groups to Attitude Level

Attitude Level	Negative	Positive	P- value
26-35 years old N (24)	14 (58.3%)	10 (41.7%)	
36-38 years old N (24)	6 (40.0%)	9 (60.0%)	
39-43 years old N (16)	8 (50.0%)	8 (50.0%)	0.740
44-60 years old N (18)	9 (50.0%)	9 (50.0%)	
Total	37 (50.7%)	36 (49.3%)	

Table4: Population Characteristics to Attitude Level

Characteristics		Attitude Level		P value
		Negative N (%)	Positive N (%)	
Gender	Male	11 (68.8%)	5 (31.3%)	0.179
	Female	45 (50.6%)	44 (49.4%)	
Nationality	Saudi	4 (80.0%)	1 (20.0%)	
	Non- Saudi	24 (82.8%)	5 (17.2%)	0.0001
	Non-Arab	28 (39.4%)	43 (60.6%)	
Language	Arabic Speaking	29 (82.9%)	6 (17.1%)	0.0001
	Non-arab speaking	27 (38.6%)	43 (61.4%)	
Profession	Nurse	36 (42.9%)	48 (57.1%)	0.0001
	Physician	20 (95.2%)	1 (4.8%)	
Working Site	Yarmook PHC	46 (65.7%)	24 (34.3%)	0.0001
	Khashimala'an PHC	10 (28.6%)	25 (71.4%)	

Results

This study aimed to evaluate the culture of reporting adverse events at PHCCs in NGHA in Saudi Arabia. The tables and diagrams provided in this study revealed the overall demographic characteristics and the responses of the participants. Using the cluster sampling as the main sampling frame, which was subsequently followed by a random sampling method, the total sample size was calculated at 107 cases, among whom 83% were female and 17% were male.

This gender imbalance is due to the fact that nursing profession is more dominated by females in most medical institutions and primary healthcare centers, and only 7.1% or 8 of them are nationally from Saudi Arabia. This led to a high number of Arabic-speaking participants, which was somehow low (37.5%, 42 out of 107 cases). In terms of working site, the majority of the participants (67.9%) came from Yarmook PHCC.

Regarding the age of the subjects, most of the participants (35.4%) were within the age range of 26-35 years. In terms of medical experience, most of the subjects had three-five years of experience (29.9% or 32%). In this study, most of the participants (60%) within the age range of 36-38 years had a positive attitude towards the OVR system.

According to the results, no statistically significant relationship was observed between age and attitude of the subjects (P=0.740). The P value for all the variables is significant except for gender with a P value of 0.179.

One of the most important questions in this study was related to the knowledge of the participants about the use of OVR system. According to the results, 93.8% (n=105) answered "yes", meaning that they were aware of the use of the OVR system, and the following diagram manifested that 57% of the participants learned about the OVR system in an orientation program, while others 26% and 17% of the remaining subjects learned about this system from their colleagues and supervisors, respectively.

In addition, 93.3% of the participants were aware of the need to report failures in equipment used for patient care management. Furthermore, results were indicative of the fact that 70.5% of the participants were willing to fill out the OVR form, whereas 15.2% of the subjects had no intention to do so. Some of the participants (40%) feared reprisal from issuing OVR, which might involve one or more of their colleagues. Meanwhile, 43% of the subjects felt that they might be negatively perceived if they reported errors through this system. Furthermore, 44.8% of the participants believed that their reported errors would affect their annual evaluations. However, more than half of the participants had a positive perception of using the OVR system. In terms of the language of the form, 87% of the subjects expressed no difficulties regarding the use of the OVR system forms, which were provided in English. Moreover, approximately 75% (n=103) of the participants had no difficulties in reporting an occurrence, variance or accident during the course of their job. In addition, approximately 62% of the participants, who were using the system on a daily basis, marked that there were no confusions regarding the use of the OVR forms.

Furthermore, most of the subjects (94.3%) had a good knowledge about the next step in the process after completing the reporting form. However, 40% of these subjects still depend on their colleagues in using the OVR form. It was also demonstrated that an overwhelming number of 94 (89.5%) cases had good knowledge about the OVR system and its concepts.

Indeed, 76.2% (n=80) of the participants confirmed a good practice level in using the OVR system and 24% revealed lower levels of practice.

In order to identify any statistically significant differences between the responses of the participants based on the differences in their KAP levels, a Chi-square test was applied, in which the P-value was equal to 0.05.

According to the results, it was also demonstrated that the majority of healthcare workers had a high knowledge level with regard to their age. The values for good knowledge level range between 83.3% and 100.0%. There were no statistically significant difference in the knowledge level of different age groups (P=0.27).

On This theme, the results indicated that most of the participants had high levels of knowledge (81.8%-96.0%) regarding the use of OVR system. Surprisingly, the lowest scores were observed among those with more than eight years of experience. However, these results were not statistically significant (p=0.445). In terms of gender, the female participants (91%) had higher knowledge levels, compared to the male subjects (81.3%), which was not significant (P=0.240).

Regarding nationality, the majority of non-Arab subjects had good knowledge in this regard, compared to other nationalities (e.g., Saudi).

In addition, the Arabic-speaking participants scored less on knowledge (74.3%), compared to the non-Arabic speakers (97%), which was statistically significant (p= 0.0001). Although most of the physicians and nurses had good overall knowledge of the OVR system, higher levels of knowledge were observed in nurses, compared to the physicians (94.2% versus 71.4%) (P=0.008), which revealed a statistically significant difference in this regard. On the other hand, the two PHCCs had the same knowledge level and there was no significant difference in this area (P=0.822).

In terms of attitude of the participants toward the use of the OVR system, it was demonstrated that those with 6-8 years of experience (60.9%) had more positive attitude toward this system. In addition, it was revealed that the results fluctuated from positive to negative attitudes throughout all the experienced groups.

Ultimately, no statistically significant association was found between experience and attitude (p= 0.223).

In terms of gender, male participants had more negative attitude toward this system, compared to the female subjects (68.8% versus 50.6%); however, this difference was not statistically significant (P=0.179).

Regarding nationality, there was a significantly negative attitude observed in Arabs, including Saudis, toward the OVR system (P<0.0001). Moreover, a significantly negative attitude was found in Arab participants (83%) (P=0.0001), compared to non-Arabic speakers (38.6%). Interestingly, physicians were almost twice as negative as nurses (P=<0.0001). In addition, the Yarmook PHCC demonstrated a higher negative perception toward the reporting system (65.7%), compared to the other PHCCs (28.6%) (P=<0.001).

Discussion

This study aimed to determine the effect of KAP of physicians and nurses on the use of the OVR system in order to improve the healthcare system, which will lead to enhanced patient safety at PHC centers in the Kingdom of Saudi Arabia. This discussion is divided into two sections; first, the general information questions and their interpretation; and second, summarizes and interprets of the research findings, which are organized according to the research aim. According to the results of the current research, approximately 6% of the participants had inadequate awareness toward the OVR system. This proportion is quite small, compared to the study conducted in China (Qing et al. 2004), where 47% of the healthcare workers had sufficient knowledge about the mentioned system. This finding is almost similar to results obtained by another study in The Netherlands (Eland et al. 1999), which reported that 6.5% of the medical practitioners were unaware of the OVR system. This lack of awareness might be due to the negligence of participants toward the orientation program for newly hired employees, wherein the OVR system was discussed.

However, regarding the foundation of the knowledge about the OVR system, almost 50% find the orientation programs unhelpful and learned the necessary information from their colleagues or supervisors. The ineffective reliance on other healthcare workers for information could result in the passing of incorrect information, as suggested by Aboshaigah (2010). Therefore, it is recommended that orientation program be closely and efficiently monitored by the officials at Khashim ala'an and Yarmook PHC Centers in order to promote and implement the aim of these centers.

Our findings demonstrated that use of the OVR system by physicians and nurses in hospitals could guarantee accurate and efficient reporting of clinical events, especially those that are considered urgent. It is of paramount importance in any healthcare setting that reporting system properly relay information and events as needed so that the patients will be given immediate and proper care. While it was attempted to determine the wholeness of all hospital operations, there must be more attention toward the OVR system to achieve this goal. Therefore, other systems in the hospitals were not included in the present study.

Our findings could be used in future studies, which will primarily focus on maximizing the competence of health practitioners and allied healthcare professionals to the existing operation systems among hospitals in Saudi Arabia, as well as other hospitals in the Middle East and other parts of the world. Since the very precious customers of these services are the patients, especially their safety as well as the safety and welfare of their families, it is clinically significant and a social responsibility for nurses and physicians to avoid any single mistake in the provision of care and assessment of health problems, specifically during the treatment process. This could be achieved through appropriate and timely relay of significant information within the hospital organizations, as well as effective communication system in all departments. Therefore, this will be a significant impetus for future research studies in this field.

Conclusion

It has been known for many years that patient safety is a priority in all healthcare settings, which requires the most proactive means of error management techniques and processes. Although most modern-day healthcare organizations use incident-reporting systems, the under-reporting of incidents is common among healthcare professionals. Some of the key factors for circumventing healthcare incidents to improve the quality and safety of patient care are increased knowledge and proper attitude. Therefore, the present study focused on the knowledge of physicians and nurses at PHCC toward the OVR system used in NGHA.

According to the results of the present study, 89.5% of the subjects had good knowledge about this reporting system. However, higher knowledge levels were observed in nurses (94%), compared to the physicians (71.4%). Some of the key factors involved in this knowledge imbalance were nationality and language.

Furthermore, 57% of both professions gained their knowledge from the orientation program provided by the human resource department at NGHA for newly hired employees. With regards to the perception of the physicians and nurses toward the OVR system at these two PHCCs, nearly all of the physicians had negative attitudes, whereas more than half of the nurses had positive perceptions toward this system. It could be concluded that the diversity in nationality, language, and work site of nurses and physicians had a significant role in their attitude toward this system.

In terms of the behavior of the studied physicians and nurses, 76.2% of all the participants demonstrated good practice, among whom 82.1% and 50% of the nurses and physicians indicated good practice, respectively.

These results might have been affected by diverse nationality, language, and work site of the participants.

Questionnaire results revealed several obstacles in using the OVR system. In the knowledge factor, it seemed that half of the participants did not attend the orientation program and got their information from their colleagues; therefore, they needed to be reminded about the importance of this program. Differences in culture and language also impede their use of this system. PHCC leadership needs to involve employees in patient safety activities and encourage them to discuss this matter in the form of teamwork. Moreover, fear of punishment and reprisal served as barriers to the motivation of healthcare providers for reporting. It is suggested that healthcare workers be motivated and supported to facilitate reporting or being reported. In addition, it is recommended that the form be simplified and the overall process be modified to achieve more accurate results.

References

1- National Guard Health Affairs. (2010). Approved policy and procedure. Riyadh: National Guard Health Affairs press.

2- Polit, D. F., & Beck, C. T. (2004). Nursing research: Principles and methods (7thed.). Philadelphia. Lippicott Williams & Wilkins.

3- Kaliyaperumal K (1994). Guideline for Conducting a Knowledge, Attitude and Practice (KAP) Study. Rotary aravind international eye bank, vol. 4, no. 1, pp. 7-9.

4- Kaneg, S., Rea, S., Verrico, M., & Weber, J. (2006). Adverse-drug-event rates for high-cost and high-use drugs in the intensive care unit. American Journal of Health System Pharmacology, Vol. 63, pp. 1876-81.

5- Aboshaiqah, A. (2010). Patients Safety Culture: A Baseline Assessment Of Nurses' Perceptions In A Saudi Arabia Hospital. Michigan. Wayne State University Press.

6- Backstrom, M., Ekman, E., &Mjorndal, T. (2007). Adverse drug reactions reporting by nurses in Sweden. European Journal of Clinical Pharmacology, Vol. 63, pp. 613-618.

7- Belton, J. (1997). Attitude survey of adverse drug-reaction reporting by health care professional. Eur J ClinPharmacol, 52, 423-427.

8- Burns, N., & Grove, S. K. (1997). The practice of nursing research: Conduct, critique and utilization (3rd ed.). Philadelphia. WB Saunders Company.

9- Cooper, Jeffrey B, (1996). Is Voluntary Reporting of Critical Events Effective for Quality Assurance? Journal of American Society of Anesthesiologists. Boston, USA.

10- Johnson, CW. (2003). How will we get the data and what will we do with it then? Issues in the reporting of adverse healthcare events. Quality & Safety in Health Care. Vol (12): 64-67.

11- Delaronde, S. (1996). Child maltreatment reporting practices and attitudes towards reporting policy among social workers and pediatricians in Connecticus. [Online] Available from: http://digitalcommons.uconn.edu/cgi/viewcontent.cgi?article=1048&context=uchcgs_masters [Accessed 13 November 2010].

12- Burns, N., & Grove, S. K. (1997). The practice of nursing research: Conduct, critique and utilization (3rd ed.). Philadelphia. WB Saunders Company.

13- Donaldson, L. (2000). An organisation with a memory: report of an expert group on learning from adverse events in the NHS. United Kingdom: Department of Health.

14- Barach, P., & Small, D. (2000). Reporting and preventing medical mishaps. BMJ, 320, 7237, 759-763.

24- Malik, R., Alam, A., Mir, A., Malik, G., & Abbas, S. (2010). Attitudes and perceived barriers of tertiary level health professionals towards incident reporting in Pakistan. NAJMS, Vol. 2, pp. 100-105.

15- Alahmadi, A. (2010). Assessment of patient safety culture in Saudi Arabian hospitals. [Online] Available from: http://qualitysafety.bmj.com/[Accessed May 11, 2010].

16- Giti, H., Seyed, A., Mortazavi, J., &Aed, Z. (2010). A Survey of Knowledge, Attitude and Practice of Nurses towards Pharamacovigilance in Taleqani Hospital. Iranian Journal of Pharmaceutical Research, 199-206. [Online] Available from: http://www.ijpr-online.com/docs/20102/IJPR1056 .pdf [Accessed 23 July 2010].

17- Jansma J, Zwart D, Leistikow I, Kalkman C, Wagner C, Bijnen A. (2010). Do specialty registrars change their attitudes, intentions and behaviour towards reporting incidents following a patient safety course?. BMC Health Services Research. Vol (10):2-9

18- Belton, J. (1997). Attitude survey of adverse drug-reaction reporting by health care professional. Eur J ClinPharmacol, 52, 423-427.

19- Lucian Leape Institute. (2010). Unmet needs: teaching physicians to provide safe patient care. Boston: National Patient Safety Foundation.

20- Badran I (1995). "Knowledge, attitude and practice the three pillars of excellence and wisdom: a place in the medical profession", Eastern Mediterranean Health Journal, vol. 1, no. 1, pp. 8-16.

21- Ministry of Health. (2006). Health statistical year book. Riyadh. Ministry of Health.

26-Nardi, P. M. (2003). Doing Survey Research: A Guide to Quantitative Methods. Boston. Allyn and Bacon.

22- Byun, K. J., & Hong, H. S. (2002). Work stress and job satisfaction of nurses working in emergency room and in admission ward. Kyungbook Nursing Science Journal, Vol. 6 No. 2, pp. 1-22.

23- De Vaus, D. (2001). Research design in social research. London. SAGE Publications.

24- Qing, L., Zhang, S., Chen, H., Fang, S., Yu, X., Liu, D., Shi, L., &Zeng, F. (2004). Awareness and attitudes of healthcare professionals in Wuhan, China to the reporting of adverse drug reactions. Chinese Medical Journal, Vol. 116 No. 6, pp. 856-861.

25- Taylor, B., Kermode, S., & Roberts, K. (2007). Research in nursing and health care: Evidence for practice (3rd ed.). Melbourne: Thomson.

26- Eland, A., Belton, J., van Grootheest, C., Meiners, P., Rawlins, D., &Stricker, H. (1999). Attitudinal survey of voluntary reporting of adverse drug reactions.British Journal of Clinical Pharmacology, Vol. 48, pp. 623-627.

27- Gregory, D. (2008). Patient safety and the management of adverse health event education curriculum. A Background Paper Prepared for the Task Force Adverse Health Events December 2nd 2008. . [Online] Available from: http://www.gov.nl.ca/ahe/additions/index.html [Accessed 13 November 2010].

28- Coyle, Y., Mercer, S., Murphy-Cullen, C., Schneider, G., &Hynan, L. (2005). Effectiveness of a graduate medical education program for improving medical event reporting attitude and behavior. [Online] Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC174408 0/pdf/v014p00383 .pdf [Accessed 12 November 2010].

29- Firth, J. (2002). Barriers to incident reporting. [Online] Available from: http://qualitysafety.bmj.com / [Accessed June 23, 2010].

30- House of Commons Health Committee. (2009). Patient safety . London: The Stationery Office Limited, Vol. 1 No. 6.