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Knowledge and Perception on Surgical and Invasive Procedure Protocols among Final Year Medical Students and Interns in A University Affiliated Hospital in Jeddah

Adel D. Almaymuni, Abdullah A. Alamri, Majed N. Alnefaie, Hatim A. Al-Abbadi
Department of Surgery, Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia

ABSTRACT

Background: medical students and interns are exposed to training programs in the hospitals to enhance their knowledge, skills and attitudes in the different clinical situations. Their training should offer an opportunity to be aware of the safety protocols in each medical department so as to prevent the possibility of errors.

Objective: this study aimed to determine the level of knowledge and perception of final year medical students and medical interns on surgical and invasive procedure protocols in a university affiliated hospital in Jeddah, Saudi Arabia. **Methods:** this was a questionnaire was administered to final year medical students and interns of King Abdulaziz University Hospital in Jeddah City, Saudi Arabia. The questionnaire consisted of two sections: demographic profile in addition to knowledge and perception on surgical and invasive procedure protocols. A total of 264 participants answered the researcher-administered questionnaire.

Results: these results showed that there was a lack of knowledge on surgical and invasive protocols of the participants with a mean score of 65.68%, which represented their agreement to the 2009 World Health Organization guidelines for safe surgery. There was a significant association between the level of confidence of the participants and their ages and year levels (p-value <.05), but not with gender. All demographic factors investigated were significantly associated with participant's belief on the importance of having knowledge on surgical and invasive protocols (p-value <.05). **Conclusion:** the results of this study call academic institutions to revisit their curriculum and training programs specifically on the area of surgery.

Keywords: knowledge, perception, surgical, invasive protocols, survey.

INTRODUCTION

The World Health Organization (WHO) Guidelines for Safe Surgery reported that in 2004 data from 56 countries showed an annual volume of major surgery estimated to be 187-281 million operations, or approximate one operation for every 25 human beings alive. While, the rates of death and complication were difficult to compare since data were so diverse, industrialized countries reported a complication rate of 3-22% of inpatient surgical procedures, and death rate of 0.4-0.8% [1-4]. It was further reported that nearly half the adverse events were preventable. In developing countries, death rate was associated with major surgery seemed to be as high as 5 to 10%. Mortality associated with anesthesia was reported to be 1 in 150 in Saharan Africa. Infections and postoperative complications were of equal significance [1,5,6,7,8].

Recognizing the substantial public health harm due to inadequate patient safety, WHO through the World Health Assembly was urging countries to strengthen the safety of healthcare and monitoring systems. Hence, in 2009 they published the protocols for surgery and invasive procedures [1]. However, since its release, there were evidently scarce studies on assessing the knowledge, attitude and compliance of healthcare practitioners regarding these guidelines.

Medical students and interns add to the workforce of health care institutions in Saudi Arabia. They are the future medical practitioners who will take charge of responding to the challenges of healthcare. They are continuously exposed to special training programs in the hospitals to enhance their knowledge, skills and attitudes in the different clinical situations. Their training offers an important opportunity for personal development and career planning [9]. As they are dealing with crucial health scenarios; it is expected that they have full knowledge of the safety protocols in each medical departments as a part of their pre-clinical competencies so as to significantly reduce the possibility of errors. Despite the diligent efforts of the researchers to look for studies similar in nature in Saudi Arabia or in Middle East Region, efforts were futile. Hence, the need to conduct this investigation was more than just a requirement but a necessity. Establishing the level of knowledge among the target population could impact all the components of the medical education especially on the development and relevance of the current curriculum in improving the knowledge and competencies of the would-be physicians. Results of this study may serve as a baseline data to launch a large scale investigation throughout the Kingdom to impact modalities of education and clinical

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relevance. Hence, this study aimed to determine the level of knowledge and the perception of final year medical students and medical interns regarding surgical and invasive procedure protocols.

METHODS

Ethical considerations

This study was conducted in accordance with ethical standards in Saudi Arabia. Participants were free to participate or to withdraw from the study at any time and an informed consent was obtained from each of them before the start of the study. The study design was approved by the institutional review board of King Abdulaziz University Hospital (KAUH). Participants were assured of their anonymity and confidentiality of their responses.

Research design

This was a descriptive cross-sectional study based on a survey conducted among final year medical students and interns of KAUH (Jeddah, Saudi Arabia), over a period of 4 months (April to July, 2017).

Sample size and sampling technique

The researchers utilized census sampling technique, where all final year medical students and interns enrolled in KAHU were invited to take part in this study.

Research instrument

Data for this investigation was entirely obtained from the questionnaire constructed by the researchers after extensive literature review. The questionnaire was administered by the researchers through face-to-face interview, email, telephone calls and other available social media platforms. The questionnaire consisted of 2 parts:

Part I. Demographic characteristics included name (optional), age, gender and year level.

Part II included Items that would check the knowledge and perception of the studied participants toward surgical and invasive procedure protocols. Questions on knowledge were answerable by "YES", "NO" and "UNCERTAIN", while perceived level of confidence and importance of knowledge on surgical and invasive procedure protocols are answerable by a Likert Scale of 4.

Statistical analysis

Data from the questionnaires was entered into a computer database and analyzed using the Statistical Package for Social Science, version 22. Descriptive and inferential measures were employed to analyze the data obtained in this study. Descriptive statistics included numbers and percentages, mean, and standard deviation. Chi-square test was the main inferential measure to check association of the variables investigated in this study. Significance was set at $p < 0.05$.

RESULTS

As shown in **Table 1,** participants belonged to a close age-group with 34.5% were 24 years old. This depicts the usual age of students in the final medical school year. The larger number of the participants was males, while only 126 participants were females. Final year medical students composed 74.2% of the participants and 25.8% were interns.

Table 1. Demographic characteristics of the studied participants (n= 264).

Demographic characteristics	Frequency	%
Age		
22	35	13.3
23	69	26.1
24	91	34.5
25	56	21.2
26	11	4.2
27	2	0.8
TOTAL	264	100
Gender		
Male	138	52.3
Female	126	47.7
TOTAL	264	100
Year level		
Final Medical Students	196	74.2
Interns	68	25.8
TOTAL	264	100

From **Table 2,** it was evident that there was a lack of knowledge on surgical and invasive procedure protocols of the participants with a mean score of 65.68%, which represented their agreement to the 2009 WHO Guidelines for safe surgery. It was noteworthy that on the 10 items given, the mean score of those who answered uncertain was 23.72%. Highest level of knowledge (73.1%) was seen on item number one, which measured their awareness that surgical and invasive procedures should be done on the correct patient at the correct site with informed consent from the patient and assent for patients who were minors. The results of each item was considered statistically significant with a p-value <.05 (.000), which elevated the validity of the distribution of their responses.

Table 2. Knowledge on surgical and invasive procedure protocols (n=264)

Items on knowledge and invasive procedure protocols	YES N (%)	NO N (%)	UNCERTAIN N (%)	p-value
1. The team should operate on the correct patient at the correct site with informed consent from the patient and assent for patients who are minors.	193 (73.1)	38 (14.1)	33 (12.5)	.001
2. The team should use methods known to prevent harm and administration of anesthetics, while protecting the patient from pain.	192 (72.7)	40 (15.2)	32 (12.1)	.001
3. The team should recognize and effectively prepare for life-threatening loss of airway or respiratory function.	185 (70.1)	44 (16.7)	35 (13.3)	.001
4. The team should recognize and effectively prepare for risk of high blood loss.	174 (65.9)	34 (12.9)	56 (21.2)	.001
5. The team should avoid inducing an allergic or adverse drug reaction for which the patient is known to be at significant risk.	170 (64.4)	38 (14.4)	56 (51.2)	.001
6. The team should consistently use methods known to minimize the risk for surgical site infection.	181 (68.6)	26 (9.8)	57 (21.6)	.001
7. The team should prevent inadvertent retention of instruments and sponges in surgical wounds.	162 (61.4)	34 (12.9)	68 (25.8)	.001
8. The team should secure and accurately identify all surgical specimens.	168 (63.6)	31 (11.7)	65 (24.6)	.001
9. The team should effectively communicate and exchange critical information for the safe conduct of the operation.	173 (65.5)	38 (14.4)	53 (20.1)	.001
10. Hospitals and public health systems should establish routine surveillance of surgical capacity, volume and results.	136 (51.5)	36 (13.6)	92 (34.8)	.001
MEAN SCORE	65.68	13.57	23.72	.001

Legend: Mean Score > 80 = high; <80 = lack of knowledge.

Table 3 showed that from among the demographic factors investigated, only gender was statistically not associated with the confidence level of the participants on their knowledge of surgical and invasive protocols (p-value >.05, 0.259). This means that being a male or a female was not a factor whether they were confident or not with their knowledge on surgical protocols.

Meanwhile, age and year level are significantly associated with confidence level of participants on their knowledge of surgical and invasive protocols (p-value >.05, 0.000, 0.002, respectively). It was evident that older participants who are most likely interns were more confident on their knowledge than the younger ones who were likely in their final year of medical study.

Table 3. Association between the demographic characteristics and perception on level of confidence of knowledge about surgical and invasive procedures.

	Demographic characteristic	Very confident	Moderately confident	Not really confident	No idea	p-value
		N, %	N, %	N, %	N, %	
Age	22	2 (5.7)	12 (34.3)	14 (40)	7 (20)	.001*
	23	1 (1.4)	26 (37.7)	35 (50.7)	7 (10.1)	
	24	7 (7.7)	29 (31.9)	29 (31.9)	26 (28.6)	
	25	9 (16.1)	18 (32.1)	12 (21.4)	17 (30.4)	
	26	5 (45.5)	1 (9.2)	4 (36.4)	1 (9.1)	
	27	1 (50)	0 (0)	1 (50)	0 (0)	
Gender	Male	15 (10.9)	51 (37)	44 (34.9)	28 (20.3)	0.259
	Female	10 (7.9)	35 (27.8)	51 (40.5)	30 (23.8)	
Year/Level	Final year	12 (6.1)	60 (30.6)	74 (37.8)	50 (25.5)	.002*
	Interns	13 (19.1)	26 (38.2)	21 (30.9)	8 (11.8)	

*****Significant

Table 4 showed that all the demographic factors investigated: age, gender and year level were significantly associated with the belief of the participants on the importance of having knowledge on surgical and invasive protocols (p-value <.05). As to age, those who were younger (22-24 years old) had a strong belief on the importance of knowledge on surgical and invasive procedures to promote patient safety, while majority of age 25-27 years old considered it not really important. The male participants and interns seemingly believed more in the importance of having knowledge on surgical and invasive protocols compared with the female and final medical student participants.

Table 4. Association between the demographic characteristics and perceived importance of knowledge on surgical and invasive procedures.

Demographic Characteristic	Very Important N, %	Moderately Important N, %	Not Really Important N, %	Not Important At All N, %	p-value
Age					
22	34 (97.1)	1 (2.9)	0 (0)	0 (0)	.001*
23	54 (78.3)	9 (13)	3 (4.3)	3 (4.3)	
24	36 (39.6)	25 (27.5)	26 (28.6)	4 (4.4)	
25	13 (23.2)	16 (28.6)	12 (21.4)	15 (26.8)	
26	2 (18.2)	3 (27.3)	4 (36.4)	2 (18.2)	
27	1 (50)	0 (0)	1 (50)	0 (0)	
Gender					
Male	73 (52.9)	30 (21.7)	17 (12.3)	18 (13)	.023*
Female	67 (53.2)	24 (19)	29 (23)	6 (4.8)	
Year level					
Final Year	109 (55.6)	33 (16.8)	32 (16.3)	22 (11.2)	.017*
Interns	31 (45.6)	21 (30.9)	14 (20.6)	2 (2.9)	

*****Significant

DISCUSSION

Although the term 'surgical adverse events' is relatively new, the concept of assessing surgical outcomes, including postoperative morbidity and mortality, has been practiced for decades [(10)]. Surgical adverse events may be associated with a variety of postoperative complications. With the current trend of decreasing economic burden and length of hospital stay, meticulous evaluation and monitoring of adverse events is essential [(11)].

In a review of the current literature, the causes of adverse events were identified to result from the healthcare process, including omission and commission, rather than being a natural process of the disease [(12)]. With worldwide evidence of substantial public health harm due to negligence in surgical and invasive procedures that compromised patient safety, the knowledge and competence of medical practitioners has been a subject of concern. Towards this dilemma this study was conducted among final year medical students and interns enrolled in KAUH.

This study revealed lack of knowledge about the WHO surgical and invasive procedure protocols among the participants with a mean score of 65.68%, considering that 74.2% of the participants were on the final year of their medical study and 25.8% were interns. It is usually assumed that as the student was promoted to a higher year in medicine, higher levels of knowledge, skills and attitude were expected, especially that these were year levels with actual patient and worst-case scenario encounter. Looking at the results in the academic standpoint, it would give us an impression that surgical and invasive procedure protocols may have not been given so much emphasis in either classroom lectures or hospital exposures, which may elucidate the low mean score of the participants. With the challenges to improve surgical safety, it is crucial that the future medical practitioners should have adequate pre-clinical competencies.

The current study also found a significant association between age, medical year level and the participant's level of confidence regarding their knowledge of surgical and invasive procedures. Those 25-27 years old and interns were more confident about their knowledge of the surgical and invasive procedure protocols. This may be attributed to the fact that they may have been more exposed to these procedures compared with the younger ones. Having more time for surgical cases exposure would improve confidence on knowledge in doing surgical and invasive procedures.

Another finding of this study was the significant association of the demographic characteristics of the participants and their belief on the importance of the knowledge of surgical and invasive procedure protocols. As to age, those who were younger (22-24 years old) had a strong belief on the importance of knowledge of surgical and invasive procedures to promote patient safety, while majority of age 25-27 years old considered it not really important. The male participants and interns apparently believed more in the importance of having knowledge on surgical and invasive procedure protocols compared with the female and final medical student participants. There seemed to be inconsistency of the result as interns were more confident of their knowledge, yet they believed that knowledge on surgical and invasive protocols was not really that important to patient safety. This demands future probing to fully shed light on this finding.

Globally, there was an underlying problem in improving surgical safety due to paucity of basic data, which was attested by this investigation. Recently, there has been an increasing public and professional interest in 'medical errors'. To emphasize both clinical improvement and avoidance of errors monitoring of adverse events and complications of health services was crucial. In addition, the preparation of medical practitioners through efficient educational and training programs to enhance their clinical competencies was invaluable [(13)].

While, it is true that they mainly assist and observe consultants and specialists, it is a necessity that medical students and interns are armed with the expected pre-clinical competencies. A study among medical interns in Jazan University during the academic year 2015 revealed that higher satisfaction rating was more evident in general surgery and pediatrics. According to the study participants this was because of their exposure and training in these areas [(14)]. Lots of exposure means a lot of preparation in terms of knowledge, skills, and attitude.

LIMITATIONS

This cross-sectional study only included final year medical students and interns enrolled in a university hospital training program. It may be followed by a longitudinal study to assess the

impact of newly adopted curriculum and training programs if any. Also, further studies including other allied healthcare workers and with larger numbers of participants are needed.

CONCLUSION

This study found that final year medical students and interns of KAHU lack knowledge about the WHO surgical and invasive procedure protocols. There was significant association between the level of confidence of the participants and their age and year level. All demographic factors investigated were significantly associated with their belief on the importance of having knowledge on surgical and invasive protocols. The results of this investigation call academic institutions to revisit their curriculum and training programs specifically in the area of surgery.

REFERENCES

1. **World Health Organization (WHO) (2017):** Guidelines for Safe Surgery. Geneva, World Health Organization. http://www.who.int/gpsc (accessed 09 August2017).
2. **World Health Organization (WHO) (2017):** Guidelines on Hand Hygiene in Health Care. Geneva, World Health Organization. http://www.who.int/gpsc (accessed 09 August 2017).
3. **Gawande AA, Thomas EJ, Zinner MJ *et al.* (1999):** The incidence and nature of surgical adverse events in Colorado and Utah in 1992. Surgery, 126:66–75.
4. **Kable AK, Gibberd RW and Spigelman AD (2002):** Adverse events in surgical patients in Australia. International Journal of Quality in Health Care, 14:269–276.
5. **Bickler SW and Sanno-Duanda B (2000):** Epidemiology of pediatric surgical admissions to a government referral hospital in the Gambia. Bulletin of the World Health Organization, 78:1330–1336.
6. **Yii MK and Ng KJ (2002):** Risk-adjusted surgical audit with the POSSUM scoring system in a developing country. British Journal of surgery, 89:110–113.
7. **Mc Conkey SJ (2002):** Case series of acute abdominal surgery in rural Sierra Leone. World Journal of Surgery, 26:509–513.
8. **Ouro-Bang'na Maman AF, Tomta K, Ahouangbévi S and Chobli M (2005):** Deaths associated with anesthesia in Togo, West Africa. Tropical Doctor, 35:220–222.
9. **Moss F (1997):** The pre-registration year. Medical Education, 31 (l 1):10-11.
10. **Alderson MR (1974):** Evaluation of health information systems. British Medical Bulletin, 30:203–208.
11. **Brennan TA, Leape LL, Laird NM *et al.* (1991):** Incidence of adverse events and negligence in hospitalized patients. Results of the Harvard Medical Practice Study I. New England Journal of Medicine, 324:370–376.
12. **Walshe K (2000):** Adverse events in health care: issues in measurement. Quality of Health Care, 9:47–52.
13. **Bruce J, Russell EM, Mollison J *et al.* (2001):** The measurement and monitoring of surgical adverse events. Health Technology Assessment, 5:1-19.
14. **Swaid AI, Elhilu AH and Mahfouz MS (2017):** Medical internship training in Saudi Arabia: intern's views and perceptions. Advances in Medical Education and Practice, 8:121-129.