Assessment of Knowledge About Patient Safety Concepts Among Medical and Pharmacy Students

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ABSTRACT

Introduction: Patient safety is a central principle of healthcare professional practice that requires a significant consideration within the teaching curricula; however, there is a lack of special courses that focus on patient safety concepts in an integrated way in many countries. This study aims to assess the knowledge of medical and pharmacy students regarding patient safety concepts. Methods: A cross-sectional study was conducted at Alfaisal University during the 2018-2019 school year. A survey consisting of 15 questions was designed with the help of the quality and patient safety department at King Faisal Specialist Hospital and Research Centre, Riyadh (KFSHRC). The survey was validated and then electronically distributed to all students enrolled in the College of Medicine and College of Pharmacy. Results: A total of 304 (22%) of 1368 students completed the survey. The survey revealed that 51% of students had an acceptable understanding of the types of human error; however, 53% of students had little knowledge about the factors that lead to these errors and 61% did not know how to report an error. Many students (41%) reported being directly involved in an unsafe situation that may cause patient harm, such as a healthcare-related error, adverse event, or inconsistent care. Most students (90%) agreed that hiding errors to avoid further implications is unethical and reporting errors is the responsibility of every healthcare provider. Conclusion: Most Alfaisal University students understand the significance of patient safety education and understand the types of human errors, yet the causes of errors and the protocols for reporting them were not well understood by most students.

Keywords: patient safety, undergraduate medical education, adverse events, medical errors, curriculum development

INTRODUCTION

Patient safety is the central principle of healthcare professional practice that requires significant consideration within the teaching curricula. There is very little research done to assess the knowledge and competence of patient safety concepts that medical and pharmacy students develop over the course of their academic career in Saudi Arabia. The lack of adequate patient safety education literature in Saudi Arabia indicates a lack of formal or specific courses that use a systematic approach to teach students about patient safety concepts.1

Bahammam and Lindjawi2 conducted a cross-sectional study in Saudi Arabia and reported that knowledge and attitudes regarding patient safety among junior healthcare physicians are below the required competency standards. Similar studies done in China, Saudi Arabia, and Australia concluded that most medical and nursing students surveyed had a keen interest in learning how to alter their practice habits to improve patient safety.3-5 The students had specific knowledge about certain safety topics but were unaware of many other important components and factors involved, thus revealing gaps in their knowledge about patient safety.3-5

In Australia, the investigators concluded that various universities maintain a standard protocol to develop the same knowledge, skills, and attitudes about patient safety among students.5 Other studies concluded that just being aware of patient safety is not sufficient;
undergraduates also need to be taught the basic skills of problem solving, error management, and communication, with a focus on the role of healthcare professionals as well as patients.\(^4,5\)

Some studies have highlighted potential obstacles that may be faced when trying to integrate patient safety education into a fully functional curriculum. For example, creating a standardized course can be demanding and challenging, as there are limitations specific to each institution’s needs, strengths, and culture.\(^3,6\) Another potential obstacle is a lack of interest in patient safety among students.\(^7\)

Given that learning about safety is largely influenced by the quality and culture of the practice environment, some studies have proposed offering external courses and volunteer positions for interested students.\(^1,6,8,9\)

Integrated, well-structured patient safety courses are needed to ensure increased knowledge and competence of the basics and to foster success among new generations of healthcare professionals.\(^9,10\) Further, to aid in developing an appropriate protocol, more studies need to be conducted to evaluate the effectiveness of patient safety education and highlighted the need to change current educational strategies.\(^11\)

In this study, we aimed to assess the knowledge and attitudes regarding patient safety concepts among undergraduate medical and pharmacy students in Saudi Arabia.

The results of this study will help investigators create a curriculum that implements standard and advanced concepts of patient safety.

METHODS

This cross-sectional, observational study (survey) was approved by the ethics committee at King Faisal Specialist Hospital and Research Centre and Alfaisal University, and all participants provided consent. Students were informed that their participation in the survey was anonymous and voluntary.

The survey was first validated using a pilot study, which was administered to 10 students, five from the College of Medicine and five from the College of Pharmacy. Their feedback was used to finalize the survey questions. The final survey consisted of 15 questions and was created using King Faisal Specialist Hospital and Research Centre's online survey system. A copy of the survey questions can be found in the Supplemental Appendix, available online with the article.

The survey was electronically distributed between March and September 2019 to all undergraduate students enrolled full-time in the College of Medicine (n = 1303) and College of Pharmacy (n = 65) at Alfaisal University, Riyadh, Saudi Arabia, as of October 1, 2018. These are the only healthcare-related programs at Alfaisal University. Continuous reminders were sent to complete the survey. Students studying non–healthcare-related disciplines were excluded. A total of 1303 medical students and 65 pharmacy students received the survey; they were informed that their responses would be kept confidential and used only for the study's purposes. The target sample size was calculated to be 304 (based on a 95% confidence interval).

Survey response data were collected, processed, and reported anonymously (ie, without student demographics). A descriptive analysis was then performed.

RESULTS

A total of 304 students of 1368 completed the survey, which is a 22% response rate. Of these, 269 (88%) were medical students and 35 (12%) were pharmacy students. The participant distribution was 11% (n = 34) first-year students, 23% (n = 70) second-year, 27% (n = 82) third-year, 23% (n = 69) fourth-year, 9% (n = 28) fifth-year, and 7% (n = 21) sixth-year (internship) students. Survey results are presented in Figures 1 and 2.

The survey revealed that 49% (n = 149) of the students who responded lack basic knowledge about the types of human error and the factors that influence patient safety. More than half of the respondents (n = 162,
53%) did not know about factors that lead to these errors, and 61% \((n = 187)\) lack knowledge regarding actions and procedures to follow when an error occurs, including how to report it and the role of healthcare organizations and general practitioners in the error-reporting process.

In a different set of questions, students were asked about how patient safety measures are applied in real life. The options included the following: minimal errors, proper error reporting, quality treatment, proper education for medical staff, proper education for patients, and no errors by healthcare providers. Most students selected proper education for medical staff \((n = 220, 72\%)\) and quality treatment \((n = 212, 70\%)\) as the main factors that influence patient safety.

Knowledge of patient rights when receiving healthcare services was also evaluated. Most students \((n = 182, 60\%)\) lacked knowledge in this area.

Regarding students’ exposure to unsafe situations, 124 students \((41\%)\) indicated that they have witnessed or were directly involved in an unsafe situation, such as a healthcare-related error; adverse event; or incomplete, excessive, or inconsistent care.

Regarding knowledge of procedures to prevent errors and promote patient safety, most students agreed that “acknowledging and dealing with their errors by the end of college study” is an important part of their job in the future \((n = 273, 90\%)\); most students \((90\%)\) also indicated a willingness to acknowledge their own mistakes and learn from them to prevent future incidents. Most students agreed that hiding healthcare-related errors to avoid further implications in their course marks is not a good practice, and that error reporting in a healthcare organization is the responsibility of every healthcare provider working in the institution \((n = 274, 90\%)\). Similarly, most students \((n = 258, 85\%)\) have a sense of self-responsibility and understand their role in error reporting and promoting patient safety. In addition, 85% of students agreed on the importance of learning from their mistakes and knowing the causes of incidents that can contribute to patient harm. These results are presented in Figure 2.

Both medical and pharmacy students recommended integrating more patient safety courses in the education system as additional elective courses. Moreover, 39% of students \((n = 121)\) indicated that instruction through direct exposure and hands-on experience in hospitals, rather than lectures and videos, would better prepare them to handle errors, adverse events, and situations involving unsafe, incomplete, excessive, or inconsistent care within the healthcare institution.

**DISCUSSION**

The present study represents 22% of the medical and pharmacy student population at a single private university in Saudi Arabia. Most survey respondents \((73\%)\) were in their second, third, or fourth year of study. Half of the students \((n = 155, 51\%)\) have a basic understanding of the types of human errors that occur during hospital practice, as well as the factors that can lead to these errors. Conversely, more than half of the participants \((n = 187, 61\%)\) reported a lack of exposure to errors and insufficient knowledge about how to handle healthcare-related errors, and 61% \((n = 187)\) lack knowledge regarding actions and procedures to follow when an error occurs, including how to report it and the role of healthcare organizations and general practitioners in the error-reporting process.
related errors, including appropriate actions and procedures and the role of healthcare organizations and general practitioners in the error-reporting process.

This lack of knowledge among students about how to handle healthcare-related errors may be explained by the large proportion participants \( n = 186, 61\% \) who were early-year students (first, second, or third year). Students in their early university years have no hands-on experience in the hospital, as the university’s medical and pharmacy programs do not involve consistent, frequent, or prolonged visits to the hospital during early study years. Also, most faculty members in the early years are academic teachers and are not active in a hospital or clinical setting during the semesters. The reasons that some students showed good knowledge about how to handle medical errors may include attending an extracurricular patient safety course, training in summer hospital programs, gaining knowledge from social media or other online sources, and hearing about experiences from healthcare professionals or patients directly involved in such situations.

The study was able to assess the current knowledge level of medical and pharmacy students regarding patient safety concepts. Students recommended enhancing and reinforcing their knowledge about patient safety by integrating more patient safety courses in the curriculum as electives. The results of the study necessitate the implementation of structured patient safety course material in the curriculum.

Patient safety is a global health priority. Promotion and enhancement of patient safety through implementation in healthcare training is encouraged by the World Health Organization (WHO).[12] Medical and pharmacy healthcare staff are among those who play the most important roles in ensuring patient safety. Therefore, for successful implementation of patient safety protocols in the healthcare system, there must be more focus on attitudes, preferences, and knowledge among medical and pharmacy students. There is still a gap in the medical school curriculum for teaching patient safety concepts in a standardized manner, including when to introduce the material and how to evaluate the outcomes.[12,13] The WHO Patient Safety Curriculum Guide for Medical Schools is currently the main evidence-based resource that guides curriculum development and introduction, and other curricula are still under development. For example, Walton et al[14] developed a valuable framework that can be used as a guide for the development of a patient safety and quality curricula. Goldman and Wong[15] identified specific learning objectives for quality improvement and patient safety (QIPS) students, including how do healthcare organizations develop QIPS priorities; quality measurement techniques; how to build an accountable team; barriers to improvement of work; and conceptualization of “hard” and “soft” skills in QIPS. These sources, as well as the WHO guide, can inform the development of curriculum for university students.[12]

Universities could collaborate with hospital QIPS departments, enabling students to access hands-on training in their final years with someone who can provide students with real incidents, cases, and discussion sessions about such scenarios. Also, students could have assignments in which they are asked to analyze a case and apply the patient safety concepts that they have learned. A systematic review of patient safety education interventions for trainee physicians and medical students by Kirkman et al[16] concluded that there is an increased effort to develop patient safety education for medical students and trainees; however, there remains a need for more adaptation, spread, and sustainment of such programs.[16] This study agrees with Alper et al,[17] whose study advocates for introducing patient safety instruction during the undergraduate years to ensure that students can safely practice medicine. They propose using a variety of teaching methods, including lectures, review of the sciences, systems and error analysis, simulated experiences, reflection on patient experiences, and mentorship.[17]

Further studies of students at government universities and at additional private universities are encouraged to develop more insight that can be generalized for other universities in the country. Future studies with a larger sample size, equal distribution of study year, and consideration of other disciplines, such as nursing (which currently does not exist in Alfaisal University), would provide a broader view about patient safety knowledge level. Further research could be done to measure the effect of continuous patient safety education on the overall quality of training for graduating healthcare professionals.

**CONCLUSION**

In summary, approximately half of the survey participants had an acceptable understanding of different types of human errors; however, they had little knowledge about the factors that lead to these errors and how to report them. Most students understand the significance of patient safety education and showed eagerness to learn more. Students recommended having an additional elective course on patient safety offered as part of the curriculum to achieve this goal. Also, there was a strong recommendation from students to expose undergraduate medical and pharmacy students to real-life patient safety situations, especially students who are approaching their clinical years. This exposure will enhance the students’ ability to handle situations they may encounter after graduation.

Alfaisal University will be considering the results of the study in building a patient safety course for students enrolled in the College of Medicine and College of Pharmacy. Collaboration with the KFSPHRC Quality Management Department will be established to provide students with more practical examples and case studies of patient safety.
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Data Sharing

Data are available for analysis upon request by contacting the corresponding author.

Supplemental Material

Supplemental data are available online with the article.

References

1. Vosper H, Hignett S. A UK Perspective on Human Factors and Patient Safety Education in Pharmacy Curricula. Am J Pharm Educ. 2018;82:6184.
2. Bahammam MA, Linjawi AI. Knowledge, attitude, and barriers towards the use of evidence-based practice among senior dental and medical students in western Saudi Arabia. Saudi Med J. 2014;35:1250–1256.
3. Bradley F, Steven A, Ashcroft DM. The role of hidden curriculum in teaching pharmacy students about patient safety. Am J Pharm Educ. 2011;75:143.
4. Almaramhy H, Al-Shobaili H, El-Hadary K, Dandash K. Knowledge, and attitude towards patient safety among a group of undergraduate medical students in Saudi Arabia. Int J Health Sci (Qassim). 2011;5:59–67.
5. Li L, Duan Y, Chen P, et al. Knowledge, skills, and attitudes of medical students to patient safety: a cross sectional pilot investigation in China. J Evid Based Med. 2012;5:124–133.
6. Leung GK, Patil NG. Patient safety in the undergraduate curriculum: medical students’ perception. Hong Kong Med J. 2010;16:101–105.
7. Nabilou B, Feizi A, Seyedin H. Patient safety in medical education: students’ perceptions, knowledge, and attitudes. PLoS One. 2015;10:e0135610.
8. Leung GK, Patil NG, Ip MS. Introducing patient safety to undergraduate medical students—a pilot program delivered by health care administrators. Med Teach. 2010;32:e547–e551.
9. Madigosky WS, Headrick LA, Nelson K, et al. Changing and sustaining medical students’ knowledge, skills, and attitudes about patient safety and medical fallibility. Acad Med. 2006;81:94–101.
10. Li G, Tao HB, Liao JZ, et al. Patient safety education among Chinese medical undergraduates: an empirical study. J Huazhong Univ Sci Technolog Med Sci. 2016;36:780–784.
11. Blasiak RC, Stokes CL, Meyerhoff KL, et al. A cross-sectional study of medical students’ knowledge of patient safety and quality improvement. N C Med J. 2014;75:15–20.
12. World Health Organization. Patient safety. Accessed Jun 15, 2020. www.who.int/patientsafety/education/curriculum_guide_medical_schools/en/
13. Nie Y, Li L, Duan Y, et al. Patient safety education for undergraduate medical students: a systematic review. BMC Med Ed. 2011;11:33.
14. Walton MM, Shaw T, Barnet S, Ross J. Developing a national patient safety education framework for Australia. Qual Saf Health Care. 2006;15:437–442.
15. Goldman J, Wong BM. Nothing soft about ‘soft skills’: core competencies in quality improvement and patient safety education and practice. BMJ Qual Saf. 2020;29:619–622.
16. Kirkman MA, Sevdalis N, Arora S, et al. The outcomes of recent patient safety education interventions for trainee physicians and medical students: a systematic review. BMJ Open. 2015;5:1–17.
17. Alper E, Rosenberg EL, O’Brien KE, et al. Patient safety education at US and Canadian medical schools: results from the 2006 Clerkship Directors in Internal Medicine survey. Acad Med. 2009;84:1672–1676.