

Patient Safety in Undergraduate Curriculum: Medical Students' Self-Rating of Knowledge and Preferred Methods of Learning

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Abstract

Background: Educating medical professionals at all levels, including during their undergraduate degree courses, is one way of improving the quality of healthcare and enhancing patient safety (PS). Despite the growing demand for quality and safety topics in medical curricula, in Saudi undergraduate medical education, these areas are not yet formally included. **Methodology:** This is a descriptive study that employed a survey method and had a quantitative cross-sectional design. The objective was to obtain students' self-ratings of knowledge regarding PS and medical errors and to identify their preferred methods of learning at a medical school in Saudi Arabia before their internships. Students from years three and four were used as a sample, with a total number of 310 students selected. The data collection tool was a web-based, self-reported questionnaire sent to the students via Survey Monkey, which was also used to descriptively analyse the collected data. **Results:** Ninety-seven students participated in the study. The students' self-rating of knowledge suggested that they had a medium to high level of knowledge about the theoretical questions related to 'different types of error', 'factors contributing to error' and 'factors are influencing PS'. However, they had a medium to low level knowledge about practical elements, including 'speaking up about errors' and 'error reporting'. **Conclusion:** This survey demonstrated broad student support for incorporating topics related to PS in their study programme. More studies should be conducted in the future to gather more information to help develop and evaluate such programmes.

Keywords: Patient safety, patient safety curriculum, patient safety education, medical errors, WHO patient safety curriculum

Background:

Health care is a complex system, and the new advances and resource burdens make it unstable and changeable. Therefore, there has been pressure from the public to improve patient safety (PS) (Woods, Patterson, & Cook, 2000). Accomplishing this, however, is not a simple task: there is a need for collaborative effort and the creation of a new culture of safety. Several strategies have been proposed to achieve these changes and to improve this culture. Besides error reporting systems and leadership, professional education and training about PS at all levels, including as a part of undergraduate medical degrees, is among the suggested plans for change and improvement.

The PS movement in the medical school curriculum began in 1999, when an Institute of Medicine report brought it to light (Klamen, Sanserino, & Skolnik, 2013). In 2009, in order to encourage and support medical schools in developing their programmes, WHO issued a PS curriculum guide for medical colleges (WHO, 2010). Since then, the subject has received considerable critical attention. Many authors believe that such an intervention is required in the early years, before students graduate from medical colleges.

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Tingle (2011) stated that in the early years, students can be influenced and their behaviours can be adjusted, but with time, they may be less likely to cope with changes and more set in their ways. He also reported that when physicians and healthcare providers are educated about PS in the early years of their education, they could act as positive advocates and agents for change. A survey of 86 international participants in a symposium on PS education held in 2006 showed that the participants recognized the importance of education on PS in undergraduate medical education. A large number of attendees stated that such education should be started in the first few years and be continued through all levels of education, with more emphasis in the later years (Sandars, Bax, Mayer, Wass & Vickers, 2007). In agreement with this, Myung et al. (2012) also reported that medical students should be aware of and demonstrate the appropriate PS skills early on in medical school and that this behaviour should be inculcated and encouraged throughout their professional education.

Patient safety education in Saudi Arabia:

PS and its quality have been receiving attention in Saudi health care. In recent times, the quality of healthcare in the KSA has improved significantly at all levels. Moreover, the country is investing resources and efforts to improve it (Almutairi & Moussa, 2014). However, despite the increased recognition of PS and the measures put in place to improve healthcare in the KSA, the safety culture has still not fully developed (Alahmadi, 2010). Almaramhy, Al-Shobaili, El-Hadary, and Dandash (2011) highlighted that many health care organisations in the KSA have PS boards and continuing professional education programmes. These activities to promote the PS culture, however, are carried out in the clinical context. In the undergraduate medical curriculum, this topic is not included as a formal subject.

Preferred methods of learning or teaching:

Lewis and Bolden (1989) discussed the types of students based on four learning styles: activist, reflector, theorist and pragmatist. According to them, the preferred method of learning differs according to the learning style of students. There are few studies on students' preference for learning methods. One such study was conducted by Teigland, Blasiak, Wilson, Hines, Meyerhoff and Viera (2013), where students were asked to rate their preferred method of learning by using five scales, ranging from not helpful to very helpful. With regard to learning about PS topics, the methods with lower scores are large-scale lectures and independent studying including reading, reflecting and using computer modules. On the other hand, learning from real-life examples of mistakes, including those of physicians and patients scored the highest and was found to be very helpful. The answers indicated that the students were mainly activists and pragmatists. This means that the students were impulsive, realistic, and practical, and that they thrived on new challenges; further, they enjoyed group work, contributing to discussions, and trying and practicing new ideas or techniques (Lewis and Bolden, 1989; Lesmes-Anel, Robinson & Moody, 2001).

Objective:

To examine students' self-rating of knowledge about PS and medical errors (MEs) and identify their preferred methods of learning

Significance of the Study:

The findings offer important insights into the current gap in knowledge about PS and MEs at a particular school. This could help medical educators, healthcare leaders and medical students to understand the current situation and act on it. Moreover, it could help identify students' needs and preferred methods of learning.

Material and Methods:

Design:

This study has a quantitative, cross-sectional design, and descriptive analytical methods have been applied to the medical students' self-rating of knowledge regarding PS and MEs and to identify their preferred methods of learning at a medical college in the eastern region of Saudi Arabia.

Participants:

Medical students from one medical school formed the population of this study; students from year three and four were selected for the sample, with 310 students participating in total. Both male and female students were included.

Data collection tool:

A web-based, self-reported questionnaire using the Survey Monkey website was used to collect the data.

Questionnaire structure:

The questionnaire had two questions: One required students to provide their self-ratings of knowledge (adapted from WHOM [2015]), and the other asked about their preferred methods of learning (adapted with minor modifications from Teigland et al. [2013]).

Procedure:

The questionnaire link and the information sheet were sent to the students via email and WhatsApp messages, as requested by them, in the first week of October 2015 (two reminder emails and messages were also sent), and it was available for completion for about three weeks. A draw for an Amazon gift voucher worth £20 was used as an incentive for participation in this study.

Statistical analysis:

The data were collected and analysed mainly by using the Survey Monkey website. The main measurements that were computed are frequency, central tendency (the mean), and variability (standard deviation); these measurements were used for all items. For the demographic data (gender and level of education), the frequency and percentage were calculated.

Ethical considerations:

Ethical approval was obtained from the ethical committee of the School of Human and Health Sciences of Swansea University. All students received an information sheet with the questionnaire link, in which the study aim and objectives were introduced, and they were informed about the confidentiality agreement. They understood that filling out and submitting the survey was considered as their agreement to participate in the study. All the students' answers were treated in a confidential manner as the questionnaires were anonymously filled in and no names were collected. Further, the data were managed using a secure computer and private account in the Survey Monkey website.

Results and Discussion:**Sample profile and response rate:**

Medical students from years three and four from one medical school in the eastern region of Saudi Arabia were chosen as the sample of the study. These two groups were studying the problem-based learning PBL curriculum, and the year four students had just started their clinical classes at the beginning of the first term, the same term this study was conducted. Out of 310 students recruited, 97 responded to the web-based questionnaire, which makes the response rate 31.3%. Of the total participants, 27 (33.75%) were from the third year and 53 (66.25%) were from the fourth year. Furthermore, 39 (48.75%) were female and 41 (51.25%) were male. And 17 students were skipped the demographic part of the questionnaire.

The responses rate was low, but this problem is not unique to this study: small sample sizes and low response rates have been a serious limitation in several earlier studies too. However, the response rate in the current study was the lowest among similar studies. The reason for the low response rate is not very clear, as the students were easily contacted via email and social media. However, the short data collection period (3 weeks) compared to other studies could have been one of the reasons, as medical students have a busy schedule. Moreover, because participation in the study was voluntary, the students may not have realised the importance of participating and assumed that others would have done it. Another reason could be related to the topic of the questionnaire, which some students may have found too sensitive and therefore chosen to avoid.

Self-rating of knowledge regarding patient safety and medical errors:

The students' self-rating of knowledge indicated that they had a medium to high level of knowledge about theoretical issues related to errors, specifically, 'different types of errors', 'factors contributing to errors' and 'factors influencing PS', with 80.41%, 87.41% and 86.63% students, respectively, reporting that they had such knowledge. In contrast, they had a medium to low level of knowledge about practical elements, including 'speaking up about errors' and 'error reporting' (73.96% and 75.25% respectively) (Figure 1.1). This finding was comparable with the results reported by Wetzel, Dow, and Mazmanian (2011), according to whom the students' responses indicated that they lacked the skill and confidence in reporting and disclosure of errors. The PBL curriculum used in this medical school could be the reason why they were aware of some of the theoretical issues related to errors. However, a possible explanation for the low rating of knowledge in practical elements may be the lack of adequate training in undergraduate medical programmes. Therefore, this area needs attention when developing a new curriculum, because medical students need to be skilled at error reduction. Such learning will also help them develop their ability to speak up about errors, engage in patient education, and improve PS (Klaman et al., 2013).

Preferred methods for learning about PS:

The results of the literature search indicated that the only study that had asked students to rate their preferred methods of learning was that of Teigland et al. (2013). Asking students to identify their preferred methods of learning is important for developing effective safety modules, so that these can be tailored to the four learning styles discussed by Lewis and Bolden (1989). As in the Teigland et al.'s (2013) study, in the present research, this question was related to PS and MEs and used five scales ranging from 'not helpful' to 'very helpful'. The students reported that PS courses should be formally taught in medical schools: 94.68% of the students were of this opinion. Further, the students' preferred methods for learning about PS were similar to those reported by Teigland et al. (2013): 94.05% of the students found real-life examples of safety and errors presented by physicians to be the most helpful. The other methods in decreasing order of preference were as follows: 'a set of seminars to present and discuss this topic' (71.43%) and 'a standardised patient case in which you are required to disclose any MEs' (53.02%). The study by Hayes et al. (2014) indicated that seminars could improve attitudes and self-efficacy related to PS, and that they could be enjoyable for preclinical medical students. In contrast with Teigland et al. (2013), where lectures had a lower rating, 41.67% of the participants in this study rated lectures as helpful to very helpful (Figure 1.2). If the learning style theory is applied to the present findings, it seems to indicate that the students were mainly activists and pragmatists. This implied that they were impulsive and thrived on new challenges. Further, they enjoyed group work and contributing to discussions. They could also be realistic and practical and be interested in trying out and putting new ideas or techniques into practice in the real world (Lemes-Anel, et al., 2001; Lewis & Bolden, 1989; University of Leicester, 2015).

Limitations:

- Students were asked to rate their own level of knowledge, so the risk of a self-rating bias cannot be ruled out.
- There is a risk of a measurement bias because the new questionnaire, which was adapted from two previous studies, has not been validated. Even though the previous questionnaires may have been tested for their reliability and validity, since this questionnaire is a combination of some parts from both and contains some modifications, the reliability or validity need to be examined. Rudestam & Newton (2014) have stated that the validity and reliability of an established questionnaire could be affected when it is modified.
- This study included students from only one medical college in the eastern region of the KSA, which means that its generalise ability to other populations may be limited.
- There is potential for a non-response bias, as the participants who responded to the questionnaire may have been more likely to be involved or interested in PS.

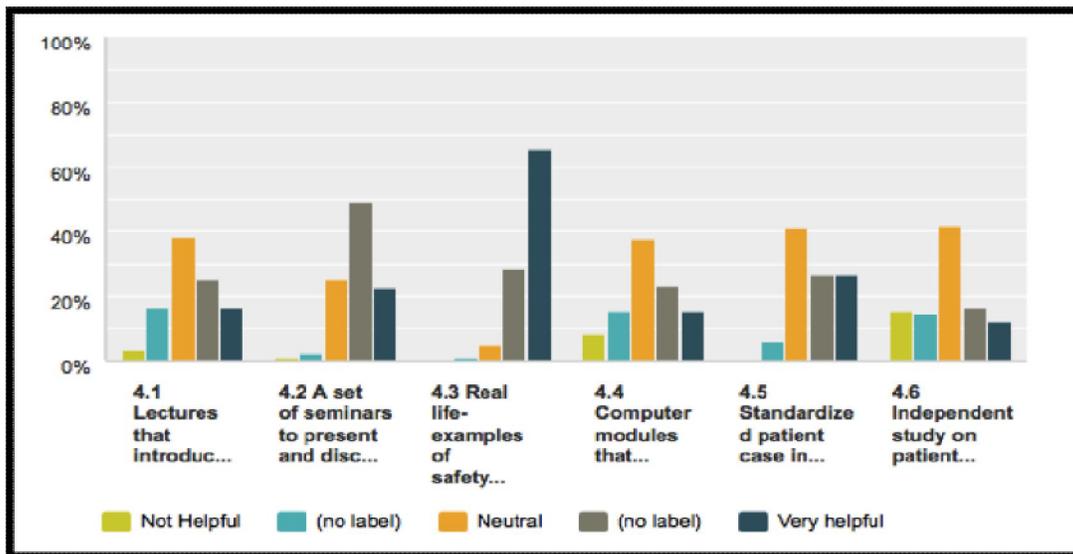
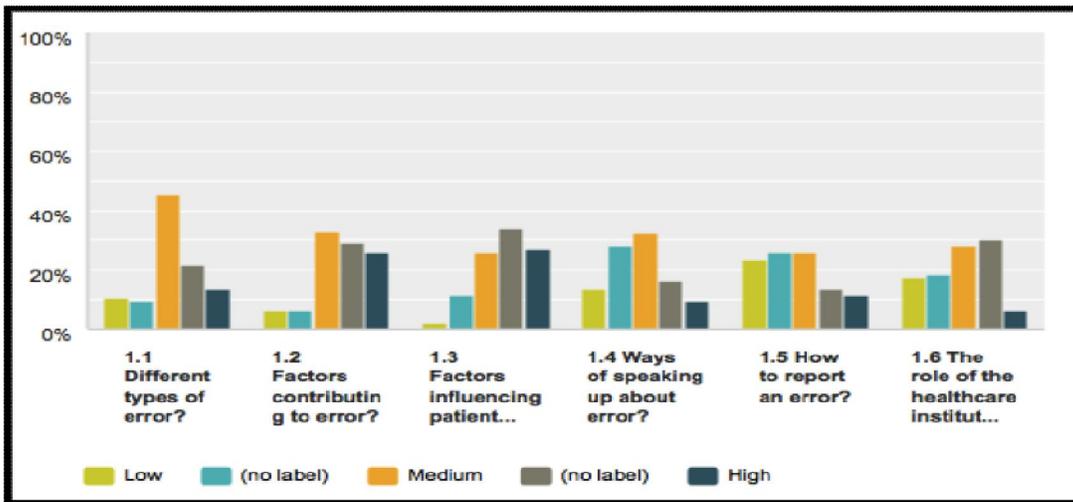
Conclusion and recommendations

Focussing on the quality of health services and improving safety culture requires more work in the KSA. Human development is the most important aspect of this issue, and educating medical professionals regarding these topics in the early years represents the start of change and development.

PS topics are not formally included as academic subjects in KSA undergraduate medical curricula, and there is very limited local information on medical students' knowledge regarding these concepts. This study describes the current state of students' knowledge about PS and errors at one medical college in the eastern region of the KSA.

This survey demonstrated broad student support for formal teaching of courses about PS and MEs in medical schools. The results showed that student had limited knowledge about the practical elements related to MEs, including 'speaking up about errors' and 'error reporting'.

These weak areas should be targeted through formal interventions that reflect reality; as the results showed, students prefer real-life examples, projects and seminars to learn about these topics. Students are a good audience for PS concepts such as human and system factors. Therefore, to achieve a better outcome, these areas should be introduced using both theoretical and practical methods, either by developing independent modules or integrating these topics with previous modules. Such formal interventions could be arranged with local healthcare organisations by developing channels of communication between the school and the hospitals, which will foster information exchange and encourage more practice-based learning. Further studies are needed to develop a PS programme, and continuous assessment is important to evaluate the students' attitudes and behaviours in practice, as well as assess the outcomes of these courses in patients and in practice.



The preferred methods of learning, and the% of students who self-rated their knowledge

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