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Awareness of forensic medicine as a subspecialty among Umm-Al-Qura medical students: a cross-sectional study

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ABSTRACT

Objective: Practitioners of forensic medicine assist with medicolegal investigations by providing expert medical advice to law enforcement during pathological investigations. Recent evidence suggests that Saudi medical students attending the College of Medicine at Al-Baha University know little about forensic medicine. The aims of the study to assess awareness of forensic medicine among medical students in the Faculty of Medicine at Umm Al-Qura University and to identify factors that affect their choice to pursue forensic subspecialty as a future career. *Methods:* The study had a cross-sectional design and was open to all students of medical at Umm Al-Qura University. The study data were collected by self-administered questionnaires distributed via social media. *Results:* A 298 totally of medical students returned completed questionnaires. Awareness of forensic medicine was poor in 176 students (59%), moderate in 69 (23.2%), and good in 53 (17.8%). The majority of the respondents (65.8%) agreed that there was insufficient information about forensic medicine in the college curriculum. A total of 232 respondents (77.9%) believed that there was a need for more education about forensic science and its subspecialties, and 144 (48.3%) were prepared to consider specialization in forensic as a career option. *Conclusion:* The findings of the study suggest that a forensic medicine department should be established at Umm Al-Qura University. More research is required to develop an education program on forensic medicine and methods that may be used to determine level of quality, to increase awareness of forensic medicine as a specialty, and to facilitate collaboration with other universities.

Key words: forensic medicine, medical students, awareness, Kingdom of Saudi Arabia

1. INTRODUCTION

Forensic medicine plays an important role in the administration of justice (Magalhães et al., 2014) and is a challenging branch of medicine that applies

medical expertise to legal proceedings (Madadin, 2013). In addition to medicolegal autopsies and forensic pathology, forensic medicine has applications in cases of rape and domestic violence. Practitioners of forensic medicine assist with medicolegal investigations by providing expert advice to law enforcement during pathological investigations, including postmortem examinations of bodies, tissues, and organs and laboratory findings (Madadin, 2013, Savka et al., 2020; Kyshkan & Savka, 2021). Forensic medicine should be a crucial component of undergraduate education in medical schools (Madadin, 2013) in terms of improving both medical knowledge and clinical outcomes (Ibrahim, 2019). In recent years, there has been a significant decrease. in the use of autopsy instruments for teaching purposes at the level of undergraduate, despite the essential role of autopsy in medical education (Ibrahim, 2019). Medical students require guidance regarding their legal duties in practicing medicine (Magalhães et al., 2014) and should have a positive attitude towards performing forensic medicine procedures (Madadin, 2013). Knowledge and attitudes towards forensic medicine can be influenced by effective teaching at the college level (Madadin, 2013).

Recent research showed that only 16 medical colleges in Saudi Arabia teach undergraduate medical students about forensic medicine (Kennedy et al., 2013; Madadin et al., 2016). Moreover, there are reports which indicate that there is a shortage of physicians in the forensic medicine specialty in Saudi Arabia despite an increase in the number of medicolegal issues that require their expertise (Almadani et al., 2012; Nofal et al., 2011). A survey by Madadin et al., (2016) found that forensic medicine was part of the curriculum in just over half (59.3%) of Saudi medical colleges, and that only 43.8% from medical students in these institutions were able to attend practical demonstrations or mortuary visits. They also found that education on forensic medicine was limited to theory in 56.3% of students. Another study of Saudi medical students from the College of Medicine at Al-Baha University showed that a high percentage of students had limited awareness of forensic medicine (Ibrahim, 2019).

Students may obtain knowledge about forensic medicine from both scientific sources (academic courses for example) and non-scientific sources, and the latter may result in many misconceptions. Worldwide, television shows and reports on forensic in the media have increased in number and popularity. Access to this information and the experiences of doctors could augment the knowledge of students (Madadin, 2013). A cross-sectional survey of year 4 medical students in Dammam, Saudi Arabia, was performed in 2013 to assess their knowledge of forensic medicine and their attitudes towards this specialty (Madadin, 2013). The results showed more than half of the participants did not understand the duties of forensic medicine physicians, and most lacked knowledge regarding the most frequent tasks performed in forensic medicine. Furthermore, approximately 75% of the respondents believed that the course of forensic medicine did not help them in their eventual careers as doctors. Another cross-sectional study in Albaha region in 2016 aimed to assess awareness of forensic medicine for medical students and to identify factors influencing the choice of forensic medicine as a future career (Ibrahim, 2019). That study found that 63.3% of students had limited awareness of forensic medicine.

To the best of our knowledge, there have been no studies on the' awareness of forensic medicine among medical students in the Makkah region. The aim of this study assess awareness of forensic medicine as a subspecialty and to identify factors that influence the choice to pursue this subspecialty as a future career among this region's medical students.

2. MATERIALS AND METHODS

This descriptive, cross-sectional study was performed at the College of Medicine, Umm Al-Qura University, Makkah, Saudi Arabia, between January and February 2021. The study was approved by the Institutional Research Board at Umm Al-Qura University (HAPO-02-K-012-2021-02-552). All study participants were informed of the objectives of the study. Their responses were kept confidential, and assurance was given that they aren't released under any circumstances. The study population was recruited from the 1,200 medical students attending Umm Al-Qura University. Using the OpenEpi sample size calculator program, we estimated that the sample size required for analysis would be 292. The sample size in total was increased to reach 300 to allow for potential loss of data. The accepted margin of error was 5% with a confidence level of 95%.

The research was conducted as an online survey and the information was gathered from completed self-administered questionnaires. Questionnaires were in English and were distributed via social media. Based on the study objectives, we designed a questionnaire that contained 14 closed questions in three sections: sex and academic year (Section 1, two questions); awareness of forensic medicine (Section 2, five questions); and sources of information, perceptions of education about forensic medicine, and potential choice of this specialty as a possible job (Section 3, five questions).

The response options in Section 2 were “yes”, “no”, and “do not know”. A score of 1 was allocated for correct answers and a score of 0 for incorrect and “Do not know” answers. Knowledge was classified as "good" for participants with a score of >75%, "poor" for those with a score of <50%, and "moderate" for those with a score of 51%–74%.

The study data were entered into a 2020 Excel spreadsheet (Microsoft Corp, Redmond, WA, USA) and the statistical analysis was performed using SPSS software (version 26; year: 2019, IBM Corp, Armonk, NY, USA). A P-value ≤0.05 was considered statistically significant.

3. RESULTS

Only 298 of the 1,200 undergraduate students asked completed the online questionnaire. One hundred and fifty-five (52%) of the replies were male and 143 (48%) were female. Fifty-six (18.8%) of students were in academic year 2, 56 (18.8%) were in year 3, 59 (19.8%) were in year 4, 70 (23.5%) were in year 5, and 57 (19.1%) were in year 6 (Table 1).

Table 1. Sex distribution of survey respondents according to year of study

Academic Year	Male, n	Female, n	Total, n (%)
2	18	38	56 (18.8)
3	17	39	56 (18.8)
4	45	14	59 (19.8)
5	48	22	70 (23.5)
6	27	30	57 (19.1)
Total	155	143	298 (100)

In Section 2, question 1 ("Do the crime scene investigator and forensic physician have the same role?") was answered correctly by 153 students (51.3%) and incorrectly by 145 (48.7%). Question 2 ("Are forensic medicine and forensic pathology the same specialty?") was answered correctly by 131 (44%) and incorrectly by 167 (56%). Question 3 ("Do forensic medicine physicians deal only with dead bodies?") was answered correctly by 113 (37.9%) and incorrectly by 185 (62.1%). For Question 4 ("Can forensic medicine physicians determine the time of death accurately?") 175 (58.7%) of students chose the correct answer and 123 (41.3%) did not. Question 5 ("Are most of the cases seen in forensic medicine rape-related?") was answered correctly by 77 (25.8%) and incorrectly by 221 (74.2%). Awareness of forensic medicine was rated as poor by 176 students (59%), moderate in 69 (23.2%), and good in only 53 (17.8%) (Figure 1).

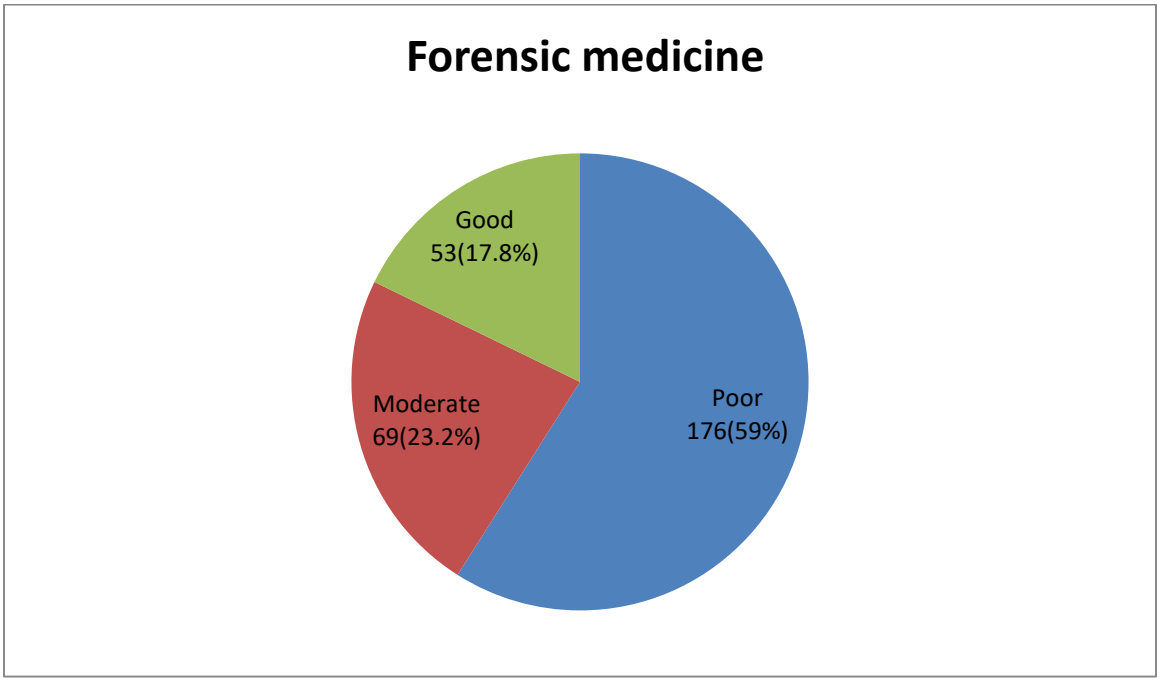

Figure 1. Level of awareness of forensic medicine among survey respondents

The answers to the questions in Section 3 indicated that the most important source of information about forensic medicine was "Media" in 66.2% of respondents and "Scientific text" in only 2.7% (Table 2).

Table 2. Sources of information about forensic medicine

Main source of information about forensic medicine	Percentage
Media	66.2%
Course	16.8%
Relative or friend	12.8%
Scientific text	2.7%
Other	1.5%

When asked if the information about forensic sciences and its subspecialties in the college curriculum was adequate, only 9.7% of students answered "Yes", 24.5% answered "Maybe", and 65.8% answered "No". In addition, 232 (77.9%) of participants agreed that more education in regards to forensic medicine and its subspecialties was needed, while 66 (22.1%) disagreed. A total of 233 (78.2%) agreed there was a need for an additional educational program on management of medicolegal cases in medical practice. Finally, 144 (48.3%) agreed that they would consider specialization in forensic medicine as a job option and 154 (51.7%) disagreed; 53.5% of the respondents who agreed were female and 46.5% were male.

4. DISCUSSION

In this study, it was proven that approximately 60% of medical participants at Umm Al-Qura University in Makkah, had limited awareness of forensic medicine as a subspecialty. This result is consistent with that of similar research conducted in the Dammam and Albaha in Saudi Arabia, (Madadin, 2013; Ibrahim, 2019) but different from findings of a study conducted in Jeddah; because that study discussed only one academic year, which is the sixth year. Saudi Arabia that shown that medical students were well aware of forensic medicine (Zaki et al., 2019). The present study indicates the modest academic progress of last year medical students, as medical students in their final year had more knowledge of forensic medicine than those in their first year (24.6% vs 10.7%).

This study findings also suggest that implementing forensic medicine education in Umm Al-Qura medical college curriculum may be beneficial. The surveyed students had never visited the site of the crime or even seen a real forensics case, indicating a gap in terms of the training and education required for forensics. The majority of the students had seen forensic cases in the media and may have received incorrect information from these sources. It is essential to learn about forensic at the college level and medical students advice able required to take forensic medicine courses that include both academic and practical elements of autopsy (Burton, 2003). Considering that autopsy is such a crucial component of forensic medicine, a general introduction to autopsy and forensic pathology advice able included in the curriculum at all medical schools (Burton, 2003). Clinical-based learning should aim to familiarize students with the ethical and legal aspects of medicolegal emergencies and the techniques used for evaluation of physical/sexual abuse cases, photographic documentation of injuries, and acquisition of forensic facts in the emergency department (Madadin, 2013). Estimation of death time is another necessary task in everyday forensic practice. The main parameters used to estimate time of death occur post-mortem; however, almost all post-mortem changes are influenced by multiple factors, which affect the precision of estimation. The body of knowledge, particularly about chemical methods for determining the exact moment of death is constantly expanding (Burton, 2003). Autopsy, sexual assault cases are subjected to a professional forensic medical evaluation, and examination of those injured in civil also criminal situations are all tasks performed by forensic physicians in Saudi Arabia (Al-Waheeb et al., 2015).

According to the finding of this study less than 10% of students were satisfied with the information on forensic medicine provided by their college, and 77.9% felt that they require more education about this field and its subspecialties. Given that the most appropriate time for an overview of forensic medicine is during the undergraduate years these findings are unsatisfactory (Zaki et al., 2019). Our findings of poor awareness, lack of satisfaction, and students feeling that they need more education about forensic medicine might be explained by the fact that there is no compulsory course on forensic medicine in the curriculum. The majority of the students polled in this research obtained their information about forensic medicine from the media, followed by relatives and friends, courses, and lastly from scientific texts.

Forensic pathology is part of the most significant subspecialties considered by clinical students studying legal medicine in the medical education system in China, which includes lengthy courses of pathology in forensic in addition to forensic psychiatry also forensic serology, and related subspecialties (Young et al., 2004). This is compatible with English models, where clinical students are qualified for taking classes in forensic pathology before taking an assessment in their third or fourth years, which is when the

forensic pathology educational plan is the most likely elective for those interested in forensic practice (Zhou et al., 2018). Surprisingly, 48% of those who responded in our survey indicated that they would consider specialization in forensic medicine as a possible career path, whereas a previous study at Dammam University found that 80% of students were prepared to consider forensic medicine as a potential future job option (Madadin, 2013). The association between sex and specialty choice has been extensively studied. In our study, 53.5% of 144 students who considered specialization in forensic medicine were female and 46.5% were male. Overall, the findings of our study underscore the importance of improving the degree of perception about forensic medicine at the college level and including more education on this subject in the curriculum.

This study has several limitations. Firstly, the online survey was sent out to students during the COVID-19 crisis when all learning at Umm Al-Qura University was conducted remotely. If the questionnaire had been physically distributed to the students, it may have been possible to achieve a larger sample size with less likelihood of random selection of answers. Second, five questions may not have been sufficient to reflect the respondents' awareness of forensic medicine. Finally, we used only three scoring categories for awareness, namely, "good" (>75%), "moderate" (>50%), and "poor" (<50%). A more detailed scoring system may have yielded more detailed information about the knowledge of students.

5. CONCLUSION

Medical students at Umm Al-Qura University have limited awareness of forensic medicine as a specialty. More research is needed to devise an appropriate curriculum, standardize education on forensic medicine, and assess the quality of these programs. A forensic medicine courses should be intensely integrated into the curriculum at Umm Al-Qura University to raise the degree of awareness of forensic medicine in cooperation with the relevant departments at other universities and the administration of Forensic Medicine Centre at the Ministry of Health. This research's findings will help researchers and educators to create an educational environment that is more conducive to select forensic medicine as a specialty.

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Authors' contribution

Ibrahim M. Al-Anazi: Manuscript editing and review – literature search – Result writing – Abstract writing – Discussion writing.
Mohammed S. Al-Qhtany: Manuscript editing and review – Literature search – Introduction writing Methods writing – Result writing –Discussion writing – Conclusion writing –Limitation writing.
Ahmad S. Al-Zahrani: Manuscript editing and review – Literature search – Introduction writing –Methods writing – Result writing – Discussion writing – Conclusion writing –Limitation writing.
Osama H. Al-Zahrani: Manuscript editing and review – Literature search – Introduction writing – Methods writing- Result writing – Discussion writing – Conclusion writing –Limitation writing.
Abdullah R. Al-Harbi: Manuscript editing and review – Literature search – Introduction writing -Methods writing- Result writing – Discussion writing – Conclusion writing –Limitation writing.
Saeed S. Al-Ghamdi: Manuscript editing and review – literature search – General supervision.
Abdullah R. Alzahrani: Manuscript editing and review.
Mahdi Alsugoor: Manuscript editing and review.

Ethical approval

The study was approved by the Ethics and Research Review Committee of Umm Al-Qura University, Faculty of Medicine (Approval number: HAPO-02-K-012-2021-02-552), Data of approval was 07/02/2021.

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Conflict of interests

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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