Simulation: Teaching Medical Ethics to First Year Medical Students within the United Arab Emirates

Helen Henderson[1], Ian Ballard[2], Laila Alsuwaidi[3], Rekha Thomas[4], Mutairu Ezimokhai[5]

Corresponding author: Ms Helen Henderson helen.henderson@mbru.ac.ae
Institution: 1. Mohammed Bin Rashid University of Medicine & Health Sciences , 2. Mohammed Bin Rashid University of Medicine & Health Sciences, 3. Mohammed Bin Rashid University of Medicine & Health Sciences, 4. Mohammed Bin Rashid University of Medicine & Health Sciences, 5. Mohammed Bin Rashid University of Medicine & Health Sciences
Categories: Professionalism/Ethics, Medical Education (General), Students/Trainees

Abstract

In today's healthcare world it is important to equip medical students with the knowledge, challenges and solutions to handle ethical dilemmas. Whilst there is no recommended format for how medical ethics should be taught it is recognized that students prefer a learner-centred approach. In a new medical college within the United Arab Emirates a simulation based medical education approach was adopted for first year, semester one medical students to support the taught theoretical underpinnings. Simulation scenarios which focused on the main ethical principles as well as the Islamic principles particularly in relation to the beginning and end of life were developed. Students were exposed to a variety of scenarios and were required to interact with standardized patients. Feedback from the students showed that 100% of them were in agreement that the simulation scenarios helped to support the theory taught in class. Simulation based medical education has the opportunity to enhance the undergraduate medical curriculum as well as to raise awareness of ethical dilemmas that students will face when qualified.

Keywords: simulation-based medical education, medical ethics, scenarios

Introduction

Medical ethics is a fundamental component and an essential facet of healthcare. It has only been in the last 30 years that teaching medical ethics has been formally included within the medical curriculum following the Pond Report (1987) and the publication of Tomorrow’s Doctors (1993). It is now recognized as important and central in undergraduate medical curricula (Sherer et al 2017; General Medical Council 1993; Miles et al 1989, Institute of Medical Ethics 1987). The purpose of integrating medical ethics into the medical curriculum is to provide
opportunities for understanding and analysing ethical dilemmas, and guide doctors in making thoughtful ethical clinical decisions (Beigy et al 2016). New graduates need to understand and possess high personal and professional values and comprehend the ethical and legal issues that can arise through the practice of medicine (General Medical Council 2009). In addition, they need to care for their patients in a fair way respecting their patient's autonomy and rights and maintaining their dignity (Stirrat et al 2010).

The General Medical Council (GMC) United Kingdom, stated that medical ethics and law should constitute one of the fundamental components of medical curriculum (General Medical Council, 1993, 2015). A consensus statement in 1998 detailed a minimal core programme for undergraduate medical schools (Consensus Group of Teachers of Medical Ethics and Law in UK Medical Schools 1998). The World Medical Association (2015) more recently produced a module for teaching medical ethics to undergraduates which included core content, and learning objectives. The World Health Organization (1995) recommended that medical ethics should be an essential part of medical education and that the teaching of it should be mandatory in all medical schools across undergraduate and post graduate programs.

Further recommendation was that medical ethics should be embedded within the medical curriculum both horizontally and vertically and not regarded as a stand-alone subject or an optional component (Stirrat et al 2010). The GMC Outcomes for Graduates (2015) recommended that new UK medical graduates must be able to demonstrate ethical and professional values.

Whilst there is agreement on the core content of medical ethics education for undergraduates (Stirrat et al 2010), there is no agreement on the best learning and teaching methods that should be used (Stirrat et al 2010, Voo et al 2017). Rather, there is a wide variety of teaching and assessment methods used in medical schools to teach medical ethics (Goldie 2000). Many medical schools include medical ethics curriculum as a separate course in the first or second year in the format of lectures or tutorials (Fox et al 1995). In the UK one study reported that only 45% of schools taught ethics and as a separate topic with the majority reporting that it is taught in classrooms (Brooks & Bell 2017). The majority of teachers of medical ethics in China have backgrounds in humanities or social sciences rather than in medicine and there is a tendency to teaching the theories and principles of ethics whilst not relating them to clinical practice ethical dilemmas (Sherer et al 2017).

There are a limited number of reviews of the literature on the effectiveness of teaching medical ethics in undergraduate medical education and there is no recognized single best model for delivering medical ethics education (De La Garza et al 2016, Eckles et al 2005). The main approaches to teaching medical ethics include: didactic teaching, case review and small group discussions. The lecture-based courses for teaching medical ethics in medical schools is argued to be insufficient for training "good doctors" as it does not empower students to use their knowledge in clinical reasoning (Beigy et al 2016). The traditional approach is to provide the students with the knowledge and cognitive skills to enable them to make ethical decisions (Callahan & Bok 1980). With this approach ethics has been taught in first or second year and the content often includes ethical theories, moral principles, codes of medical ethics and a range of clinical issues (Fox et al 1995).

Role modelling is another important method of imparting ethical principles to students. This is viewed as part of the hidden curriculum (Voo et al 2017). However, the assumption is that seniority assures ethical perceptiveness (Campbell et al 2007)!

The World Health Organization (1995) recommended that teaching should involve active student participation with the didactic component restricted to basic concepts and codes of conduct.

A widely used approach has been case review and discussion where students are encouraged to discuss and explore
difficult ethical dilemmas based on the case. There has been widespread support for this case-based approach instead of focusing on the theory (Fox et al 1995). Students using case studies state the approach that they would take in a particular situation, however this does not explore the student’s communication skills or allow the scenario to necessarily unfold and thereby guide the student moving from comprehension to application (Buxton et al 2014). In addition, a systematic review was inconclusive about the effectiveness of case-based teaching despite evidence showing that students enjoyed it (Thistlethwaite et al 2012). One study from Saudi Arabia (Aldughaither et al 2012) where ethics is taught to first and third medical year students showed that more than 85% of the students felt that the mode of instruction should be changed from lectures, case based lectures and large group discussions.

Literature supports the use of a learner-centred format or student based programs which involves the students in role playing obtaining informed consent, breaking bad news and communicating do not resuscitate orders (Beigy et al 2016; Loike et al, 2013). Simulation-based medical education (SBME) is a powerful educational strategy enabling students to practice and demonstrate competence in areas including knowledge, skills, critical thinking and communication thereby enriching learning experience (Motola et al 2013; Salas et al 2013; Bensfield et al 2012; Issenberg et al 2005). It provides a bridge between didactic and observational learning to clinical practice using experiential learning, however it has rarely been used to teach medical students about ethical conflicts or to assess their understanding of ethical principles applied to difficult clinical decision making (Tritrakarn 2014). Simulation-based learning also provides a platform for medical students to freely practice their understanding in ethical principles and reasoning to learn from possible mistakes than jeopardizing a patient when in practice (Al-Elq 2010).

Ethics education must, in addition, to the traditional values seek to foster contemporary cultural sensibilities in medical students (Voo et al 2017). This includes understanding of impact of religious affiliations of patients. Islam is predicted to be the largest religion in the world by 2070 and yet little information has been published on teaching undergraduate students on Islamic medical ethics. Within the sphere of the doctor-patient interaction ethical conflicts can arise due to religious and cultural differences (Padela 2007). Medical students need to be educated on the sensitivities to religious and cultural views different to their own. Simulation offers a practical method for teaching Islamic medical ethics without risk of hurting sensitivities.

It has also been recommended that medical ethics should be taught early within the undergraduate curriculum and reinforced throughout the course and that it should be integrated with other comparable subjects such as clinical communication (Stirrat et al 2010).

In line with this it was decided to introduce SBME to the Introduction to the Practice of Medicine Course, which includes professional medical ethics in the first semester of the first year of the medical curriculum in a new medical college in the United Arab Emirates. The intention was that it would complement the theoretical component and assist in helping students to link the theory to practice by demonstrating a variety of ethical dilemmas where students would have to participate and reflect. It was important to establish if the students found the simulation approach an acceptable and feasible way to learn. This study evaluates the student experience of using simulation to teach medical ethics and professionalism.

**Methods**

Students participated in the simulation sessions throughout November 2016 with a new cohort participating in November 2017. Medical students (n=55 & n=38) received the theoretical component of ethics teaching delivered using a mixture of approaches: lectures, flipped classroom approach and tutorials at the start of the semester, in a one credit course. Then they were exposed to scenarios that addressed the ethical principles of: respect for autonomy;
beneficence; non-maleficence and justice. Scenarios, in addition focused on truth-telling, duty of care, professionalism and addressed components of ethics in Islam with regards to the Islamic Principles, Islamic *Fiqh* and general Islamic teachings focusing on the beginning and end of life.

Students were divided into two sections and each section was subdivided into three groups with a maximum group size of 8 students. The students attended the simulation centre three times within the course. This was for an introduction to medical ethics, followed by the beginning of life scenarios and then the end of life scenarios. Each group of students was exposed to a maximum of 9 scenarios. One student per group volunteered to take part in each scenario. The active student was given a student information sheet of the scenario and given time to read it before being introduced to the simulated patient. The rest of the student's group observed the scenario and interaction via a video capture. The students who were observing were required to critique the student participating in terms of their communication skills, the participant's ability to address the issue in this case and whether they were in agreement with the outcome (see Table 1). All students were required to sign a confidentiality agreement at the start of the course.

The scenarios took place in a range of settings within the simulation centre. These included consulting rooms, wards and the ICU environment. Each section was given an overall introduction to the day’s simulation activities and then the groups were allocated to their appropriate debrief room for a 5-minute pre-brief, followed by a 10-minute scenario and a 15-minute debrief before they moved onto their next scenario. Within the debrief component the students are guided by the facilitators to reflect on the scenario and decisions made using the theoretical knowledge gained in the earlier part of the semester. The Gibbs model of reflection is used to structure the de-briefs of all the scenarios (Gibbs 1988). At the end of the session all the groups reassembled for a summary of the main points, an opportunity for any questions and to complete the evaluation.

Standardized patients (SPs) were used in all of the scenarios to act out a variety of roles. All SPs had previously received training and been assessed for their skill in playing a variety of roles. All SPs were included in the de-brief and invited to constructively contribute in terms of their perspective into what had gone well and what could have been improved.

Scenarios were written by the simulation team in-line with the content in the course study guide and approved by the course coordinator to ensure that they addressed the program learning outcomes which included: “describe the principles of biomedical ethics; apply the principles of biomedical ethics in patient-centred care and demonstrate professional behaviour towards self, patients, colleagues, and society” (see Table 2).

At the end of every session, students were asked to complete a pilot evaluation form which was created in-house and not previously tested for validity or reliability. They selected the relevant words that best described the session for them. Students had the opportunity within the questionnaire to choose words from a word cloud format which contained an equal number of positive and negative words. The positioning of the words changed to ensure that there was no bias to positive statements. In addition, they were asked: "did the session help support the theory already learnt in class and if there was anything that they would have liked to have seen done differently". Changes were made on receipt of the feedback. Twenty percent of the assessment mark for the course was allocated to participation at the simulation centre.

The study qualified for exemption from review under the following categories:

- Research conducted in established or commonly accepted educational settings, involving normal educational practices
- Research involving the use of educational tests
This was confirmed by Professor Essa Kazim, Chairman of the MBRU-IRB.

Results

Tables (1. Students 2. Methods, 3 & 4 Results)

The results from the questionnaires showed that 100% of the students stated the session helped to support the theory already learnt in class, 75% wanted more simulation, 88% found the sessions a positive learning experience, 86% reported that the sessions made them think and found them informative. No negative words were highlighted throughout the weeks. In answer to "what one word would you use to describe today's session" students wrote: fun, unique, informative, exceptional, innovative, perfect, intense and satisfying.

An additional question was added into the second cohort's questionnaire where students were asked to state their preferred method of teaching from: lecture, tutorial, simulation and from the material shared on the learning management system. The results from this question (Table 3 & 4) showed that 85% ranked simulation as their most preferred method (with 6% ranking it jointly as first choice alongside tutorial), 12% ranked it as second to tutorial and 3% as their third preference after tutorial and lecture.

Discussion

The results have clearly showed that students have found it a worthwhile process and are requesting for more simulation opportunities to enhance their learning. Using simulation as a method of teaching comes with some challenges. The human resources required (knowledgeable facilitators, trained and experienced simulated patients), the need for scheduling and organization of different groups, development of appropriate scenarios, present different challenges than those faced when delivering lectures or running case reviews. Nonetheless, simulation has been shown to be beneficial in incorporating experiential learning into the undergraduate medical curriculum (Heitz et al 2010). Simulation has also shown to be effective in the teaching of basic and clinical knowledge, teamwork and communication (Wang et al 2013). The results here showed that the students actively engaged with the simulation, and found it a preferable method of learning. In terms of cost and time, return of investment for medical simulation is an understudied field with the cost effectiveness still to be determined (Van de Ven et al 2017).

An avenue that has not yet been explored within this ethics course is using the clinical simulation for assessment purposes apart from participation and attendance. This is perhaps an area that could be developed and included as part of assessment in later years as a component of OSCEs. The simulation scenarios were designed to complement the theory taught and to help the students to illustrate the relevance of ethical principles in their future clinical practice. It was therefore aimed as being a formative experience and one that would help them to reflect on their own views and opinions as well as learning about different cultural ethical perspectives.

There are limitations to the feedback as it was not possible to compare groups to establish if the students who have undergone the simulation sessions have a greater appreciation and understanding of medical ethics, or a better understanding of their own ethical views, than those who have not experienced it.
Conclusion

Populations are becoming more culturally diverse and medical students and practitioners are more on the move globally exposing them to cultural and social attitudes, values and beliefs different from their own. It is important therefore that a better understanding of different cultural values and ethics are explored to help prepare the physician of the future.

This study shows that SBME has the potential to be used to facilitate the teaching of medical ethics. It has the opportunity to enhance the undergraduate medical curriculum as well as to raise awareness of ethical dilemmas that students will face when qualified. If used appropriately it should encourage medical students to express and justify their decisions in ethical issues, using the principles of medical ethics and the Islamic principles to guide them.

Take Home Messages

| Take Home Messages: |
|---------------------|
| • SBME has a role in the teaching of medical ethics to undergraduate medical students |
| • The teaching of medical ethics has no single best mode of delivery |
| • Medical ethics should be introduced early into the medical curriculum |
| • SBME enhances the theory taught in lectures and tutorials |

Notes On Contributors

**Helen Henderson** is the Lead Simulation Educator at the Khalaf Al Habtoor Medical Simulation Centre (KHMSC, MBRU). She leads on embedding simulation based medical education into the undergraduate and postgraduate programs. She is a Certified Healthcare Simulation Educator (CHSE) and has contributed to international review groups for simulation educators.

**Mr. Ian Ballard** is the Manager of KHMSC. He is a Certified Simulations Operator and has been on international review groups for Simulation Operations. He has participated and spoken at International Conferences on simulation. He also has an active role in the education in Undergraduate and post graduate courses.

**Ms. Rekha Ann Thomas** is a Clinical Research Professional at the College of Medicine, MB RU and assisting in the Curriculum and Research committees as well as on the Institutional Review Board.

**Dr Laila Alsuwaidi** is an Assistant Dean for Student Wellbeing and Happiness, Assistant Professor of Molecular Haematology at College of Medicine in MB RU. She participated as a guest speaker and chairperson in number of professional committees and conferences. She also served as mentor of graduate students & author of several manuscripts.

**Professor Mutairu Ezimokhai** is Professor of Obstetrics and Gynecology at Mohammed Bin Rashid University of Medicine and Health Sciences(MBRU). He co-ordinates and teaches in the Course on Introduction to the Practice of Medicine offered in the first two semesters of the six-year curriculum. In addition to Medical Education, he is
interested in Hypertension in Pregnancy.

Acknowledgements

Not applicable

Bibliography/References

Al-Elq, A. H. 2010. Simulation-based medical teaching and learning. Journal of Family and Community Medicine, 17(1), 35–40.

Aldughaither SK, Almazyiad MA, Alsultan SA, Al Masaud AO, Alddakkan ARS, Alyahya BM, Alhassan HA, Albalawi RS, Alammar RA, Abaalkhail MS & Aljarallah JS. 2012. Student perspectives on a course on medical ethics in Saudi Arabia. Journal of Taibah University Medical Sciences. 7 (2) 113-117.

https://doi.org/10.1016/j.jtumed.2012.11.002

Alinier, G. 2011. Developing High Fidelity Health Care Simulation Scenarios: A Guide for Educators and Professionals. Simulation Gaming, 42, 9-26.

https://doi.org/10.1177/1046878109355683

Bensfield LA, Olech MJ & Horsley TL. 2012. Simulation for high- stakes evaluation in nursing. Nurse Educ. 37(2):71- 74.

Beigy M, Pishgahi G, Moghaddas F, Maghbouli N, Shirbache K, Asghari F & Abolfat-h Zadeh N. 2016. Students’ medical ethics rounds: a combinatorial program for medical ethics education. J Med Ethics Hist Med, 9:3.

Brooks L & Bell D. 2017. Teaching, Learning and assessment of medical ethics at the UK medical schools. J Med Ethics. 43, 606-612.

https://doi.org/10.1136/medethics-2015-103189

Buxton M, Phillippi J & Collins M. 2014. Simulation. A new approach to Teaching Ethics. J Midwifery Womens Health 00:1–5.

Callahan D & Bok S. 1980. The Teaching of Ethics in Higher Education. Hastings-on-Hudson, New York: Hastings Center.

https://doi.org/10.1007/978-1-4613-3138-4

Campbell AV, Chin J & Voo TC. 2007. How can we know that ethics education produces ethical doctors? Medical Teacher. 29: 431-436.

https://doi.org/10.1080/01421590701504077
Consensus Group of Teachers of Medical Ethics and Law in UK Medical Schools. 1998. Teaching medical ethics and law within medical education: a model for the UK core curriculum. Journal of Medical Ethics. 24: 188-92.

De La Garza S, Phuoc V, Throneberry S, Blumenthal-Barby J, McCullough L & Coverdale J. 2016. Teaching Medical Ethics in Graduate and Undergraduate Medical Education: A Systematic Review of Effectiveness. Acad. Psychiatry.

Eckles RE, Meslin EM, Gaffney M & Helft PR. 2005. Medical Ethics Education: Where Are We? Where Should We Be Going? A Review. Acad. Med. 80 (12) 1143-1152.

Fox EF, Arnold RM & Brody B. 1995. Medical Ethics Education: Past, Present and Future. Acad. Med. 70: 761-769.

General Medical Council.1993. Tomorrow's Doctors: Recommendations on Undergraduate Medical Education. London: General Medical Council.

General Medical Council. 2009. Tomorrow's doctors: outcomes and standards for undergraduate medical education. London: General Medical Council.

General Medical Council. 2015. Outcomes for Graduates. London: General Medical Council.

Gibbs, G. 1988. Learning by doing: A guide to teaching and learning methods. Oxford: Further Education Unit, Oxford Polytechnic.

Goldie J. 2000. Review of ethics curricula in undergraduate medical education. Medical Educ. 34, 108-119.

Heitz C, Eyck RT, Smith M & Fitch MT. 2010. Simulation in Medical Student Education: Survey of Clerkship Directors in Emergency Medicine. Western Journal of Emergency Medicine. 12 (4) 455-460.

Institute of Medical Ethics. 1987. The Pond Report. Report of a Working Party on the Teaching of Medical Ethics. London: IME Publications.

Issenberg SB, McGaghie WC, Petrusa ER, Lee GD, Scalese RJ. 2005. Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review. Med Teach. 27:10–28.

Loike, J. D., Rush, B. S., Schweber, A., & Fischbach, R. L. 2013. Lessons Learned from Undergraduate Students in Designing a Science-Based Course in Bioethics. CBE-Life Science Education. 12, 701-710.
McGaghie WC, Issenberg SB, Petrusa ER, Scalese RJ. 2010. A critical review of simulation-based medical education research: 2003-2009. Med Educ. 44:50–63.

Miles SH, Lane LW, Bickel J, Walker RM, Cassel CK. 1989. Medical Ethics Education. Coming of Age. Acad Med 64; 705-14.

Motola I, Devine LA, Chung HS, Sullivan JE, Issenberg SB. 2013. Simulation in healthcare education: a best evidence practical guide. AMEE Guide No. 82. Med Teach. 35, e1511–30.

Padela AI. 2007. Islamic Medical Ethics: A Primer. Bioethics. 2:3. 169-178.

Salas E, Paige JT, Rosen MA. 2013. Creating new realities in healthcare: the status of simulation-based training as a patient safety improvement strategy. BMJ Qual Saf. 22:449–52.

Sherer R, Dong H, Cong Y, Wan J, Chen H, Wang Y, Ma Z, Cooper B, Jiang I, Roth H & Siegler M 2017. Medical ethics education in China: Lessons from three schools. Educ Health; 30:35-43.

Stirrat GM, Johnston C, Gillon R, & Boyd K. 2010. Medical ethics and law for doctors of tomorrow: the 1998 Consensus Statement updated. J Med Ethics 36:55–60.

Thistlethwaite, J. E., Davies, D., Ekeocha, S., Kidd, J. M., Macadougall, C., Matthews, P. Purkis J & Clay D. 2012. The Effectiveness of Case-Based Learning in Health Professional Education. A BEME Systematic Review: BEME Guide No. 23. Medical Teach. 34, e421-e444.

Tritrakarn P, Berg BW, Kasuya RT, and Sakai DH. 2014. Can We Use Simulation to Teach Medical Ethics? Hawai'i Journal of Medicine & Public Health. 73, (8).

Van de Ven J, Van Baaren G, Fransen A, Van Runnard Heimel P, Mol B & Oei S. 2017. Cost-effectiveness of simulation-based team training in obstetric emergencies (TOSTI study). European Journal of Obstetrics & Gynecology and Reproductive Biology. 216, 130-137.

Voo TC, Braddock III CH, Chin J, Ho A. 2017.Ethics and attitudes in: Dent J, Harden RM, Hunt D, Editors. A
Wang Z, Liu Q & Wang H. 2013. The utility of simulation in medical simulation-based education improves medics’ clinical skills. J Biomed Res. 27, 81-84.

World Health Organization. 1995. The Teaching of Medical Ethics: Fourth Consultation with Leading Medical Practitioners, Geneva, World Health Organization.

World Medical Association. 2015. Medical Ethics Manual. 3rd Edition. Available at: http://www.wma.net.

### Appendices

#### Table 1. The student peer review rating tool

| The Participant | poor | fair | good | Very good | excellent |
|-----------------|------|------|------|-----------|-----------|
| 1 How would you rate the participant's communication skills? | 1    | 2    | 3    | 4         | 5         |
| 2 How would you rate the participant's ability to address the issue in this case? | 1    | 2    | 3    | 4         | 5         |
| 3 Are you in agreement with the outcome from the scenario? | Yes  |      |      |           | No        |

#### Table 2. Part A: Introduction to Medical Ethics

| Learning objectives for the introduction session | Clinical Scenarios | Scenario theme | Ethical Principles addressed |
|-------------------------------------------------|--------------------|----------------|-------------------------------|

- Understand the ethical dilemma and the process of Ethical Decision Making
- Explain the Principles of Medical Ethics
- Develop effective communication skills
- Appreciate the implications of truth-telling and the doctor-patient relationship
- Describe the responsibility of the physician as a healthcare advocate
- Recognize unprofessional behavior from professional behavior
- Recognize behaviors in self and others that can be categorized using elements of professionalism

| Scenario | Theme | Islamic principles addressed |
|----------|-------|-----------------------------|
| 1. Just let me be Mr. Ahmad has gangrene in his left lower leg and it is recommended that it should be amputated. Mr. Ahmad is refusing to have the operation even though the decision will in all likelihood lead shortly to his death. | Respect for Autonomy | Respect for Autonomy Beneficence & Non-maleficence |
| 2. The Ward Round The medical student is invited to join on the ward round by the senior doctor. Prior to the ward round commencing the senior doctor tells the medical student that the patient was given the wrong chemotherapy dose yesterday, that the patient is fine and that they are not telling the patient as he will just get stressed. | Unprofessionalism | Respect for Autonomy Beneficence & Non-maleficence |
| 3. The Kidney Donation Sara wishes to donate a kidney to her father who is suffering from a life-threatening kidney disease. Both Sara and her father Ahmad are very close. During routine blood tests, the doctor has discovered that Ahmad is in fact not Sara’s biological father, although Sara can still donate her kidney to him as it is a close enough match. | Truth telling & duty of care | Respect for Autonomy Beneficence & Non-maleficence |

Part B: Examples of scenarios used for the Ethics in Islam component
| Assisted reproduction | Beginning of life |
|-----------------------|------------------|
| A married couple who wish to have a child have come to see the Doctor; however, the 32-year-old wife knows that she is a carrier for Huntington's disease (HD). The couple wish to discuss the possibilities of harvesting the wife's eggs, then having each egg checked for the HD gene and those without the gene fertilized and reimplanted. Other scenarios included: | The principle of protection of life, maqsad hifdh al nafs |
| Contraception   | The principle of necessity, qa'idat al dharurat, allows waiving normal practices like informed consent to protect life. |
| Sterilization    | The principle of intention, qa'idat al yaqeen, requires that all intervention and research must be based on evidence as much as is possible in an emergency |
| Surrogacy        | The principle of protection of resources, maqsad hifdh al maal |
| Termination      | The principle of injury, qa'idat al dharar, requires minimizing harm while maximizing benefits in emergency procedures, protection of privacy and confidentiality |

| Organ donation    | End of life |
|-------------------|-------------|
| Abdul is a 34-year-old Muslim Lebanese man who was involved in a road traffic collision 2 days ago and has suffered a severe head injury. He was admitted, intubated and ventilated, to ICU with fixed and dilated pupils. CT showed a massive intracerebral bleed. He has been declared brain dead following being tested on two separate occasions. You have already spoken to Abdul's wife telling her the results of the test. Rajiv, a Hindu and Indian national with a two-year history of chronic renal disease has been maintained on regular hemodialysis. He is on the waiting list for a suitable kidney donor. You now need to discuss the possibility of organ donation with Aisha, Abdul's wife. | The principle of certainty, qa'idat al yagiin, the physician should act on available knowledge and not on doubts or speculation |

Other scenarios included:
- Stopping resuscitation
- Withdrawing treatment
Table 4: Students preferred Method of Teaching

| Teaching styles | Students ranked from 1-4 their preferred teaching style with 1 being their most preferred and 4 their least preferred |
|-----------------|---------------------------------------------------------------------------------------------------------------|
|                 | % who ranked the teaching style as 1 | % who ranked the teaching style as 2 | % who ranked the teaching style as 3 | % who ranked the teaching style as 4 |
| Lecture         | 3                                      | 21                                      | 58                                      | 18                                      |
| Tutorial        | 18                                     | 61                                      | 18                                      | 3                                       |
| Simulation      | 85                                     | 12                                      | 3                                       | 0                                       |
| LMS             | 0                                      | 9                                       | 12                                      | 79                                      |
| Total           | 106 *                                  | 103                                     | 90                                      | 100                                     |

* Two participants ranked the Simulation as equal first with another teaching style

Declaration of Interest

The author has declared that there are no conflicts of interest.