LETTER TO THE EDITOR

Fostering quantitative reasoning abilities in medical education for future healthcare professionals

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Madam, Quantitative reasoning (QR) refers to quantitative skills that involve the use of mathematical and statistical reasoning within a real-world context and are essential for understanding and studying social reality.[1] QR, a multidisciplinary approach that combines mathematical skills, knowledge application, logical reasoning, and real-world problem-solving, is crucial for practical and informed decision-making across various disciplines.[2] There is an international consensus that quantitative skills are crucial for undergraduate students in the life sciences.[3]

In 2020, recognising the importance of quantitative reasoning (QR), Higher Education Commission (HEC) introduced a policy for undergraduate degrees. Dow University of Health Sciences (DUHS) has implemented Quantitative Reasoning as a key component of major health disciplines, including undergraduate medical programme. This initiative is part of the first module of the MBBS programme and was introduced in 2024. This was a significant step toward mobilising future healthcare professionals with essential analytical skills. However, this shift had not been without challenges. Integrating quantitative reasoning into the undergraduate MBBS curriculum has increased stress levels among medical students, who are already facing challenges in transitioning from intermediate studies to the rigorous demands of medical school. This change has added to an already heavy workload, as students are expected to master a wide range of medical subjects within a limited timeframe. The additional analytical requirements of quantitative reasoning, combined with clinical subjects, have made the adjustment particularly challenging, leaving students feeling overwhelmed.

To alleviate concerns among medical students about quantitative reasoning and the challenges of an integrated curriculum, we should design modules that enhance skills in quantitative numeracy. Small group teaching will be effective for learning QR because it facilitates interaction and detailed explanations.[4] Additionally, integrating interactive whiteboards into sessions is a practical method for teaching test ordering and interpretation to undergraduate students.[5] A hybrid learning model could be implemented by providing tutorials as additional student support.

In conclusion, although integrating QR into medical education may present initial challenges, it ultimately provides students with essential tools for their professional development. By designing a thoughtful curriculum and employing supportive teaching strategies, we can help students overcome their apprehension about QR and transform it into a valuable skill set that will benefit them in their medical careers.

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References

1. Matthews KE, Adams P, Goos M. The Influence of Undergraduate Science Curriculum Reform on Students' Perceptions of their Quantitative Skills. Int J Sci Educ 2015;37:2619-36. doi: 10.1080/09500693.2015.1096427
2. Elrod S. Quantitative reasoning: The next "across the curriculum" movement. Peer Rev 2014;16:4-8.
3. Rylands L, Simbag V, Matthews KE, Coady C, Belward S. Scientists and mathematicians collaborating to build quantitative skills in undergraduate science. Int J Math Educ Sci Technol 2013;44:834–45. doi: 10.1080/0020739X.2013.783239
4. Fielding S, Poobalan A, Prescott GJ, Marais D, Aucott L. Views of medical students: what, when and how do they want statistics taught? Scott Med J 2015;60:164-9. doi: 10.1177/0036933015608329.
5. Gouzi F, Hédon C, Blervaque L, Passerieux E, Kuster N, Pujol T, et al. Interactive whiteboard use in clinical reasoning sessions to teach diagnostic test ordering and interpretation to undergraduate medical students. BMC Med Educ 2019;19:424. doi: 10.1186/s12909-019-1834-1.

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