

EDITORIAL

REVISITING EXPERIMENTAL PHYSIOLOGY IN UNDERGRADUATE MEDICAL CURRICULUM

Idrees Farooq Butt

Department of Physiology, Yusra Medical & Dental College, Islamabad, Pakistan

Physiology being an important subject among basic medical sciences is taught during initial years of undergraduate degree programs throughout the world. Experimental Physiology is an integral component and has its role in comprehension of the physiological concepts and development of conceptual knowledge. With influx of enormous amount of new information in recent past, contents in the theory component are tremendously increased while practical part is relatively lagging behind. Use of live animals in undergraduate laboratories is being discouraged and introduction of basic clinical skills and use of manikins is promoted. At the same time, many important systems of the subject are not covered in the experiments being conducted in majority of institutions; even they do not exist in the list of experiments included by Pakistan Medical & Dental Council (PM&DC) in the revised curriculum. To keep a balance between theory and practical components and to address the growing global needs, a serious revisit of the experimental part of the subject is needed. Use of modern equipment, introduction of new experiments in the neglected areas, strengthening skill labs and adopting measures for development of professionalism is need of the hour. Physiologists need to address this challenge. Meanwhile, there is a growing trend by many medical institutions to adopt integrated curriculum and assessment. It is responsibility of educationists to revisit the subject in such a manner that without compromising the essentials, the subject is incorporated in the curriculum.

Keywords: Experimental Physiology, revisit, clinical skills, manikins

Pak J Physiol 2018;14(4):3-4

Physiology is an important subject in basic medical sciences and taught in first two years in medical colleges in Pakistan for MBBS degree program.¹ A physiologist plays an important role in the learning process of a student in undergraduate courses to enable him rationally understanding the pathological changes taking place in human body. Experimental physiology being the integral component of the subject provides an important tool to comprehend the theoretical concepts and introduces the student to basic clinical skills required for examining the patient.

The experimental physiology curriculum for undergraduate MBBS students includes haematology, animal experiments, and basic clinical skills. Animal experiments have been used previously in all medical colleges of the countries in this region.² A few years ago, Medical Council of India (MCI) has issued guidelines to discontinue live animal experiments for training of medical students, and instead to use alternatives to animal experimentation.³ In Pakistan many medical colleges have also discontinued animal experimentation and incorporated new experiments using computer assisted LabTutor (PowerLab[®]). Students and faculty feedback also support that animal experiments should be replaced as equal understanding of physiological concepts can be obtained by using alternative methods.⁴ There are certain components taught in experimental physiology that have no clinical relevance. There are complaints by the doctors after their graduation that during preclinical part of training in

the medical college too much irrelevant knowledge was imparted, and especially practical component needs to be revised and made more clinically relevant.⁵ Thus there is a dire need to include alternative to animal experiments. Furthermore, there are areas of Physiology like gastrointestinal, renal, endocrine and reproductive system where experimental component is minimal and there is need to introduce new experiments for better comprehension of the physiological concepts.

There is great deal of technological progress in recent past and innovative measures are being adopted in the curricula especially laboratory component, like use of LabTutor, skill lab and use of high fidelity patient simulators and manikins.^{6,7} The Pakistan Medical & Dental Council (PM&DC) guidelines and mission of MBBS program recommends to produce a seven-star doctor with competencies like skilful, knowledgeable, community health promoter, critical thinker, professional, researcher and a leader. It is also recommended that 50% of training time to be spent for practical skill learning.¹ In the present scenario, it is essential to synchronize teaching methodology in physiology with requirements of today. In experimental physiology especially, there is lot of room for improvement and revisit to enhance learning.

However, to keep a balance between theory and practical component, there is need to introduce new experiments especially in the areas where already deficiency exists and newer methods are available, and old equipment has been replaced by improvised

versions. Clinical examination of the patient and interpretation of laboratory data need to be given more emphasis.

Frequent student feedback about the adopted teaching methodology provides accurate analysis of current status and necessary amendments required in the curriculum. In a study carried out recently in India animal experiments were found irrelevant and not useful while haematology and human experiments were considered useful by the students. It has been suggested that reducing animal experiments and incorporation of clinical skill learning provides better understanding of the subject.⁷ Introduction of experiments like EMG, EEG, nerve conduction studies, audiometry, ophthalmoscopy and autonomic function studies were found more useful.⁸ In a study inquiry based learning has been found very effective in an exercise physiology course to develop problem solving skill, independent thinking and ability to explore new ideas.⁹

Although medical institutions in the country are responding to growing global needs by increasingly integrating global health issues into their curricula, but the evidence shows that the number of training facilities available is not keeping pace with the growing demand. Personality development, humane attitude, empathy, conduct and responsible attitude is required to be made part of training and assessment. Furthermore, it is important to consider how communication skill training, especially role of emotional intelligence and empathy training is translated by student. Clinicians and basic medical science teachers have to strive to get more involved and actively participate in virtual reality-based training. At the same time while revisiting the curriculum, the developers have to strive to ensure to

integrate experimental components of other related subjects more objectively and constructively to get better comprehension of basic medical science subjects. This endeavour will help in laying solid foundations of basic science subjects during preclinical years of training and will compliment comprehension of clinical subjects later.

REFERENCES

1. PMDC. Curriculum of MBBS (Revised 2011). Islamabad: Pakistan Medical & Dental Council; 2011.
2. Medical Council of India. Regulations on Graduate Medical Education 1997. India: Medical Council of India; 1997. Available from: www.mclindia.org/know/rules-mbbs.htm [Accessed June 22, 2016]
3. Medical Council of India. Establishment of medical college regulations, 1999–Animal house. India: Medical Council of India; 2014. Available from: www.mciindia.org [Accessed Feb 27, 2017]
4. Paralikar S, Shah C. Faculty perceptions of the strengths, weaknesses and future prospects of the current medical undergraduate experimental physiology curriculum in Gujarat, India. *Indian J Physiol Pharmacol* 2015;59(1):109–16.
5. Hariharan TS. Need for changes in practical pharmacology curriculum of medical undergraduates. *Indian J Pharmacol* 2004;36(3):181.
6. Oriol NE, Hayden EM, Joyal-Mowschenson J, Muret-Wagstaff S, Faux R, Gordon JA. Using immersive healthcare simulation for physiology education: initial experience in high school, college, and graduate school curricula. *Adv Physiol Educ* 2011;35:252–9.
7. Harris DM, Bellew C, Cheng ZJ, Cendan JC, Kibble JD. High fidelity patient simulators to expose undergraduate students to the clinical relevance of physiology concepts. *Adv Physiol Educ* 2014;38:372–5.
8. Goyal R, Garg R, Goyal PR. Need for changes in practical physiology curriculum of medical undergraduates. *J Clin Diagn Res* 2017;11(6):CC06–08.
9. Nybo L, May M. Effectiveness of inquiry based learning in an undergraduate exercise physiology course. *Adv Physiol Educ* 2015;39(2):76–80.

Address for Correspondence:

Dr. Idrees Farooq Butt, Professor of Physiology, Yusra Medical & Dental College, Islamabad, Pakistan. **Cell:** +92-335-5244481

Email: idreesfb@yahoo.com

Received: 28 May 2018

Reviewed: 7 June 2018

Accepted: 12 June 2018