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The Need to Have a Valid and Reliable Tool to Measure the Anatomy Education Environment

Siti Nurma Hanim Hadie[1], Asma' Hassan[1], Zul Izhar Mohd Ismail[1], Mohd Asnizam Asari[1], Aaijaz Ahmed Khan[1], Fazlina Kasim[1], Nurul Aiman Mohd Yusof[1], Husnaida Abdul Manan[1], Tg Fatimah Murniwati Tg Muda[2], Wan Nor Arifin Wan Mansor[3], Muhamad Saiful Bahri Yusoff[4]

[1]Anatomy Department, School of Medical Sciences, Health Campus, Universiti Sains Malaysia, Kubang Kerian, 16150, Kota Bharu, Kelantan, Malaysia. [2]Faculty of Medicine and Health Sciences, Universiti Sultan Zainal Abidin, Kota Campus, 20400 Kuala Terengganu, Terengganu, Malaysia. [3]Biostatistics & Research Methodology Unit, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kota Bharu, Kelantan, Malaysia. [4]Medical Education Department, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kota Bharu, Kelantan, Malaysia.

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ABSTRACT

Anatomy is an important knowledge for medical practice. Insufficient anatomy knowledge leading to errors in identification of anatomical structures during medical practices has been reported in many countries. Many medical students seem to have difficulties in learning anatomy and retaining the knowledge for future practice, thus this might reflect the possible flaws in anatomy education. In order to achieve optimum anatomy education environment and to close the gaps in education, measuring the students' perception on anatomy teaching and learning is a pre-emptive measure needed by educationists. At present, there is no valid and reliable inventory available to specifically evaluate the anatomy education environment. Therefore, this article highlights the importance of having such inventory.

CORRESPONDING AUTHOR: Dr Siti Nurma Hanim Hadie, Anatomy Department, School of Medical Sciences, Health Campus, Universiti Sains Malaysia, 16150, Kota Bharu, Kelantan, Malaysia.
E-mail: snurma@kb.usm.my

Introduction

Anatomy is an important discipline in medical education that has high clinical relevancy. Being the oldest medical subject, teaching and learning in anatomy have undergone various changes to be in line with the modern medical curriculum. At present, anatomy is less taught through didactic lectures and dissection because these are considered to be overly time-consuming (1, 2). With major revamp in the medical curriculum from traditional to problem-based learning (PBL) and system-based, anatomy contents in the medical syllabus and total hours of anatomy teaching have been reduced to accommodate newer medical subjects such as molecular biology and genetics (3, 4). On top of that, many medical schools are incorporating innovation and

technology into their anatomy teaching. Thus learning anatomy is no longer perceived as content-driven (5-7).

Despite the changes in anatomy education environment, anatomy knowledge among medical students and qualified medical doctors seem to be declining. This is an alarming situation since sufficient anatomy knowledge is required for safe practice (8). Many medical students perceived deficiencies in their anatomy knowledge and felt insecure to apply their knowledge once they entered clinical years (9, 10). Besides that, medical students at PBL-based medical school were found to have less anatomical and other basic sciences knowledge than do their colleagues at traditional medical schools despite being taught relevant integration and application (11-13). It is worth to highlight that inadequate anatomy knowledge among the medical doctors had resulted in serious medico-legal litigation (14). This can be prevented if medical teachers particularly anatomists could create an optimum anatomy education environment to enhance effective learning (15, 16).

Evaluation of the anatomy education environment

Evaluation of the educational climate has been highlighted as the gateway to the delivery of a high quality medical education (15, 16). At present, various methods of educational evaluation of students have been developed to measure the student performance, including some forms of testing. In medical and allied health sciences, the Dundee Ready Educational Environment Measure (DREEM) has been internationally accepted as a useful tool to provide feedback on strengths and weaknesses of the educational environment (17-23). Nevertheless, this inventory measures the general education environment which does not cover some important areas in anatomy, such as role of dissection in modern curriculum and amount of anatomy contents in the syllabus as echoed by many researchers (24-27).

Measuring students' perception on specific area of interest influences the effectiveness of feedback process (28). Besides having powerful effects on learning, this focused feedback could provide important information on the possible flaws in anatomy education. Such information would reduce discrepancies between the current understandings or performance and a desired understandings or performance (28). Thus, gathering student perception through a specific, valid and reliable tool is valuable to signify the strengths, weaknesses, opportunities and threats to the anatomy department.

Important possible domains and items for measuring the anatomy education environment

Identifying suitable domains and items for measuring the anatomy education environment is the most important stage in developing the future anatomy education environment measurement inventory. The best reliable consensus of the content experts should be sought to ensure that these domains and items could really represent the current anatomy education environment.

Among major important areas that should be considered prior to developing the domains and items for the future inventory are the medical curriculum, anatomy teaching and learning methodologies and assessment methods as addressed by many researchers (4, 9, 10, 15, 16, 25,). These areas of concern are almost similar with the domains of DREEM inventory; however, the items to gather the feedback should be more specific towards the anatomy context. As for example, the inventory should be able to measure the students' perception and acceptability on the cadaveric dissection when exploring on the anatomy teaching method.

The medical school curriculum is the most important factor that should be explored in the future inventory. With curriculum reform from traditional to PBL-based in many medical schools, anatomy teaching has been vastly modified with limited number of lectures and reduction in the cadaveric dissection activity (11). Over the years, the anatomy teaching

methodology has been improvised with more reliance on models, plastinated specimens, imaging techniques and simulation software despite the importance of cadaveric dissection (2, 4, 29-31). Thus, knowing what the students perceive on different methods of anatomy teaching would be very valuable for future planning.

Although there is significant reduction in the anatomical content in the modern curriculum, anatomy knowledge remains the most important pillars in modern medical practice and allied health professions. There is a general public and media pressure for doctors to have sufficient knowledge of anatomy for safe medical practice (8). Unfortunately, several studies revealed that many medical students perceived themselves as having inadequate anatomy knowledge and they felt insecure to apply their knowledge to clinical practice (3, 9). Therefore, students' perception of adequacy and relevancy of the current anatomy content and teaching methodology is important to prevent further decline in anatomy education.

Another important area that should be taken into consideration when creating the domains and items for measuring the anatomy education environment is the anatomy assessment. It is generally accepted that assessment is a single powerful tool that drives the student to learn in education process (32). However, assessment can also result in unintended consequences such as students can be examination-oriented which lead them to become superficial learners (32). Moreover, assessment that is out of alignment with the curricular goal can cause stress to the students and lead to deterioration in learning outcomes (33). Therefore, establishing the students' perception on this issue would help to improve the future assessment format.

Apart from that, the future inventory should also explore other contributing factors that might affect students' learning in anatomy such as anatomy teachers, classroom atmosphere and peer supports. The evaluation should not only confine to students' perception on these factors but should also focus on students' self-perception on their interest towards the subject, anatomy knowledge comprehension, knowledge integration and application. These would ensure that all important aspects in the anatomy education environment can be evaluated at the same time.

Benefits of a having valid and reliable inventory

Validity is referred to the ability of a tool to measure attributes which it intended to measure while reliability is described as the consistency or reproducibility of a measurement over time and occasions (29). Both validity and reliability are essential qualities of an instrument that must be tested prior to its usage. This is to ensure that the instrument would measure what it is supposed to measure and the measurements obtained are consistent and reproducible over time and occasions (34, 35, 36). A valid and reliable inventory will serve as a benchmarking tool for medical schools to compare their anatomy education environment.

Conclusion

With this background, it is essential to develop a specific tool that measures the anatomy education environment and to test its acceptability and workability. Multicenter collaboration among medical teachers especially anatomists should be carried out in order to come out with a valid, reliable and universal tool for measuring the anatomy education environment.

Recommendation

Concerted effort should be initiated to identify the relevant domains and items that reflect the anatomy education environment. Future validation study should be performed to verify the psychometric properties of the constructed domains and items. If the tool is successfully developed and validated, it will be a precursor in promoting future research in anatomy education.

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