Perspective

Integrated Curriculum in Medical Schools in Pakistan – What? Why? When? and How Much

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Abstract

Medical profession is undergoing rapid transition to address the challenges of modern-day healthcare delivery. Therefore, medical education and training have come under scrutiny to ensure medical practitioners are not only fit to practice medicine but also maintain social accountability. Medical education in Pakistan is undergoing changes to address local healthcare needs and to remain accredited in line with standards delineated by the World Federation of Medical Education. Yet, the majority of medical schools in Pakistan have maintained traditional curriculum consisting of pre-clinical and clinical divide. Elsewhere, undergraduate curricula have moved away from teacher-centered pedagogy, are more flexible, and have introduced innovative teaching methods, integrating content vertically and horizontally. The modern-day doctor must demonstrate competency in multiple roles while remaining sensitive to the context of the community they serve. We argue that medical schools in Pakistan must adopt integrated curriculum, and student-centered learning activities.

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Introduction

Medical education has evolved rapidly over the past few decades. Globalization of healthcare delivery, social circumstances of healthcare recipients, aging population, advancement of technology affect the delivery of healthcare are some significant determinants altering the way contemporary medicine is practised across the globe.[1] In present era of social accountability, increasing societal pressure demands practicing members of the medical profession to continually demonstrate core professional values.[2] Future practitioners must demonstrate not only that they are knowledgeable and skilled but must also demonstrate core competencies of communication, collaboration, teamwork, leadership, life-long learning, professionalism, safe and ethical practice of medicine. Henceforth, the medical profession is under much scrutiny than ever before and especially how healthcare professionals are trained. The governing bodies regulating medical profession across the globe have responded positively. For instance, in the United Kingdom, the General Medical Council (GMC) and Accreditation Council for Graduate Medical Education (ACGME) in the United States of America

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developed and updated standards of medical practice.

Recent shift in trend from structure and process-based curricula to outcome-based education ensures and satisfies all involved stakeholders that graduating doctor is safe to practise medicine.[3] In the United States, ACGME has published six core competencies of medical knowledge, communication and interpersonal skills, patient care, system-based practice, practice-based learning and improvement and professionalism.[4] These outcomes by its virtue removes inauthenticity of separating clinical practice into knowledge, skills, and attitude; instead, recognizes the authentic interaction and integration of learning domains.

Furthermore, ground-breaking developments in the field of educational and cognitive psychology have influenced the way how course/ program curriculums are planned, designed & delivered. Considering the adult learning principles and contemporary educational theories, there has been a shift from teaching to learning; from providing information to creating learning opportunities and supportive environment for students to actively participate.[5]

Lastly, the pace at which new information is generated through research in all fields of healthcare and allied suggests that focus must shift from imparting information to encompassing skills by which students can hone life-long learning skills.[6] This contemporary approach to medical education is evident of turning tides from traditional, didactic, teacher-centred model of curriculum to students-centred, outcome-focused, competency-based medical education.

Integrated Medical Curriculum:

Over the past two decades, the concept of integrated curriculum has been introduced based on revised medical education standards by accrediting and regulatory bodies in North America and the UK. Moreover, the World Federation Medical Education (WFME) responsible for global standards of medical education also acknowledge and encourage integration.[7]

The basic concept of an integrated educational program is that the whole is greater than the sum of parts. However, integrated curriculum has many definitions and dimensions.[8] Horizontal integration describes the integration of various subjects or contents of subjects at the same stage of the delivery of curriculum. For example, anatomy, physiology, biochemistry, pharmacology, and microbiology may all be taught and learnt around an 'organ system' in a thematic manner. Vertical integration refers to an integration of clinical content in the basic science or early meaningful introduction of clinical exposure/rotations during early undergraduate. Therefore, basic science content is embedded in clinical context, throughout the program. A third form is 'spiral' integration (a combination of both horizontal and vertical) refers to when discrete topics are introduced and revisited from normal to abnormal with additional layer of difficulty from simple to complex followed by clinical application and clinical practice. Several recurring themes are covered throughout the course which includes communication skills, medical ethics, patient safety, quality management, behavioural and social sciences, evidence-based medicine, and professionalism. The content is revisited in incremental level of complexity as students' progress during their course of study. Thus, an integrated approach to course or curriculum attempt to make connections between the topics/ subjects by cutting across the topics/ subjects and unifying the concepts for the medical students to promote deeper learning for real-life situations. Although, it is not just science-based subjects that are taught to understand the disease but now broad-based education with topics from the field of humanity and social sciences and health promotion to include the important outcome of health–illness meaning in a broader sense are included to produce graduate with cultural sensitivity.[9,10] This type of integration helps graduates to meet the needs of population it serves and equips the medical schools to fulfil the vision of social responsibility.

In parallel to the reforms in program outcomes and the circular design; educational strategies have also evolved with increasing emphasis on learning rather than teaching. SPICES model of educational strategies is an example of framework for adopting curricula on a continuum between students-centred learning and teacher-centered teaching.[11] In the student-centered curriculum, teacher acts as a facilitator rather than as an information provider, and students are given the responsibility for their education. The student-centered curricula provide several opportunities for integration. Problem based curriculum and presentation-based or cased-based curricula provide students an opportunity to solve genuine problems based on information they

acquire, and in the process, they receive facilitation from the tutor to a varying degree. Meanwhile, themes/ cases are revisited through the curriculum in a spiral fashion, so that new learning is built on the previous and challenging for their level such that competence of the student increases over time.

Why Integrated curriculum?

The popularity, need and the requirement of integrated curriculum has grown over the last two decades, it is important to study the pros and cons of the integrated curricula compared to the traditional discipline-based curricula.[8] To begin with, the discipline-based curricula help medical students develop subject-specific skills in a logical manner, until they reach the level desired by the pre-specified goals. Such an approach has advantages. Achieving a level of 'excellence in a certain subject (discipline) is rewarding because of the sense of appreciation of the depth and complexity of the subject and provides stimulus to go to the next level. However, the downside is that the student is left to somehow integrate the knowledge and skills when faced with practical issues in patient management. An integrated approach to curriculum helps students to make connections between various areas of a specific subject between subjects and "real-life" problem. Therefore, an integrated approach helps students to develop a bigger picture by providing overarching concepts and ideas. Application of learnt skills in a real-life situation is more gratifying to many than to have the satisfaction of achieving excellence.

Moreover, discipline focused teaching provides depth, an integrated approach adds breadth to the learning process and the kind of depth of understanding that comes once something is understood in larger context. In other words, integrated approach provides depth within the breadth. An additional feature of integrated curriculum is the acquisition of knowledge and skills in a spiral fashion. Skills are reinforced over time and new knowledge is acquired such that the students appreciate the relevance of knowledge. This promotes retention of knowledge and deeper learning. Moreover, the ability to apply the skills in a complex case gives a feeling of achievement.

Furthermore, integrated approach promotes life-long learning since there is always a higher order skill to be learnt with the use of deeper knowledge, the spiral continues to unfold and the quest to explore and gain knowledge and hone skills never ceases. There is a good perception of learning as students see the relevance of clinical medicine while learning basic science concepts and principles making the learning experiences more enjoyable. This is reinforced by presence of senior clinicians as a role model to mentor medical students at an early stage of their education. Furthermore, the attrition rate has been shown to be low.

Traditional versus integrated curriculum:

During the early stage of curriculum reforms, several factors have been identified to limit introducing and implementing integrated programme of teaching/ curriculum. Most important being resistance to change. Integration at curriculum level requires change in the social structure of the medical college as administration of curriculum moves from departments to central administration most likely under curriculum committee at an undergraduate level.[12,13] Moreover, long held wrong believes of teaching and learning based on traditional views may limit its implementation. Especially, a false perception amongst the faculty that decreasing the number of lectures and increasing the small group interactions may reduce the importance and number of important topics to be covered, and hence quality of the graduate students may deteriorate. However, they may effectively be dealt with involving medical educationists, intense faculty development, capacity building and incentives.

Evidence is beginning to emerge to support one type of curriculum over the other. Common pedagogical methods for curriculum integration include problem-based learning (PBL), and case-based learning (CBL), also referred to as presentation-based learning. Learning in these activities is based on realistic patient cases around which basic, clinical, and even social sciences are studied together. Evidence related to the effectiveness of PBL and CBL is emerging. The inquiry-based nature underpinning the CBL methodology enables linkage between classroom-based learning to clinical management, thereby promotes a bridge between real-life situation and clinical practice.[14] Such an approach seemed popular among both students and facilitators due to its structured nature of the learning and guidance by tutors thereby promoting interactive discussion and motiva-

tion. Problem-based learning as an educational strategy has been prominently used in medical education since its inception at the McMaster university in 1969 to counter the effects of traditional curriculum's inability to develop the problem solving in clinical setting. By virtue of its definition and form that is employed is fit for vertical integration. Qin et al.[15] in their study concluded that PBL was able to improve the medical education environment. Authors measured the medical education environment using Dundee Ready Education Environment Measurement (DREEM) where students were exposed to either problem-based learning (PBL) or lecture-based curriculum (LBC).

Owing to the different study designs, student population and tools and the outcomes, some individual studies are described below. In another metanalysis, Nandi et al.[16] interviewed students and teachers using the PBL and LBC concluded that there was no convincing evidence of improved performance using the PBL. Although, students who used the PBL showed better interpersonal skills and psychosocial knowledge, students using the LBC performed better in basic science examinations. Teachers tended to enjoy teaching PBL. McParland and colleagues[17] compared consecutive cohorts of clinical students. Students completed a questionnaire to assess their learning styles and completed the end-of-attachment examinations including multiple-choice paper and a viva. The performance indicated that students on the PBL curriculum scored higher; however, authors concluded that this improvement was not due to students using more effective learning styles or having more favourable attitudes towards psychiatry. In another study[18] authors interviewed two groups of medical students in the last two years of medical school, who had graduated either on the traditional lecture-based curriculum (LBC) or the integrated problem-based learning (PBL). On the knowledge scale, both groups of students scored equally, whereas on the attitude scale, PBL students scored higher, especially in their confidence on conducting and publishing research. Grant and colleagues[19] compared learning contexts at two medical schools in the UK, using mixed method comparative study. One medical school used the LBL, and the other used PBL. Students attending the school using PBL scored significantly higher for reflection in learning, self-efficacy in self-directed learning and for deep approach to learning. Tayyeb et al.[20] compared two groups of final year students attending surgery and obstetrics & gynaecology rotations either PBL or LBC. Knowledge, clinical reasoning and problem-solving were assessed. Students who experienced LBC had better content knowledge, and students who studied through PBL demonstrated better clinical reasoning and problem-solving skills. Another study[21] concluded that irrespective of the curriculum, self-regulated learning skills do not develop during medical school. Authors compared the development of self-regulated learning during the pre-clinical stage of medical school amongst 384 students using the self-regulation of Learning Self-Report Scale. Laven et al.[22] compared LBL with PBL using self and clinical assessments in the intern year. Although there was no difference between the two curriculum cohorts in their preparedness for clinical skills generally, PBL graduates felt better prepared in their awareness of legal and ethical issued, and the LBL cohorts felt better prepared in their understanding of disease process. There was no difference in workplace-based skills. Notwithstanding the difference in study designs and the outcomes, it appears that both types of curricula have some advantage and that the differences become more apparent towards the end of the studies. Study participants that underwent PBL had similar knowledge to participants undergoing LBC; however, former participants demonstrated additional development of problem solving, critical thinking, raised awareness, cultural sensitivity, improved interpersonal skills and favourable attitude towards learning.

In addition to the increasing adaptation and the popularity of integrated curricula across the globe, various organizations in north America and the western Europe demand the curriculum to be coherent, coordinated and integrated within and across the academic periods of study. Several organization including, the Association of American Medical Colleges (AAMC), the GMC in the UK, the Association of Faculties of Medicine of Canada, and the Australian Medical Council have published recommendations to adopt integrated curriculum.

Situation in Pakistan:

Education in general and medical education in particular is going through a phase of evolution in Pakistan. In 2011, the concept of a seven-start doctor was conceived by Pakistan Medical and Dental Council (PM&DC) in collaboration with Higher Education Commission (HEC) and was published as a draft of revised MBBS

curriculum.[23] Their vision was of a seven-star Pakistani doctor possessing the competencies of being knowledgeable, skilful, scholar, researcher, community health educator, professional and a role model. At the time of writing there are 48 medical colleges in the public sector in Pakistan, and 76 medical colleges in the private sector for undergraduate medical education. This is in addition to the 61 colleges for undergraduate education in dental education. The intake of public-sector medical colleges is more than 8,200 annually, and those of private sector is approximately 8,800 annually (https://pmdc.pk). Recently, there has been a drive to implement integrated curriculum in all public sectors medical schools in Pakistan, however, there is a difference in understanding of the concept of integration.[24]

Experience with the implementation of integrated curriculum in Pakistan:

Over the past few years, some medical schools in Pakistan have adopted integrated curricula, either problem-based, or organ system-based. Ghias et al.[9] reported their experience of integrating humanities and social science course into the undergraduate medical education program in a private medical school, advocating to produce physicians who are socially sensitive and scientifically competent. Similarly, Akram et al.[25] propose an integrated curriculum by embedding various themes, such as, basic medical science, simulation skills, clinical science, personality development, research, and entrepreneurship throughout the curriculum in a modular fashion. Another study[26] recommend tailoring the undergraduate curriculum to cater to the needs of Muslim patients such as fasting during Ramadan and the Islamic ruling on termination of pregnancy. Kayani et al.[27] interviewed the tutors a semi-structured guide and concluded that the teachers were supportive of integrated curriculum but wanted proper training for its successful implementation.

Conclusion

Integrated medical curriculum has been implemented in some medical schools in Pakistan. There are only a few reports of the experience so far. However, we suggest that due to the inherent complexity of the understanding of the integration, "What, When, Why, and How much", both amongst faculty and students, a hybrid approach in medical schools may be better suited consisting of discipline-based courses in the first year of medical school. The emphasis should be on teaching the foundation of medicine, such as, anatomy, physiology, and biochemistry. Additionally, biostatistics, evidence-based medicine ethics and professionalism, and subject related to humanism can be introduced at this stage. Subsequently the curriculum should be integrated, both horizontally and vertically, with an increasing level of difficulty from simple to complex problem in a spiral fashion, and the addition and integration of themes, such as, patient safety, quality management and research methods. Vertical integration is important and deserves special mention, as it seems to extend the acquisition of skills and knowledge beyond the curricular structure.[28] Vertical integration can go beyond undergraduate education, as this has been shown to have an impact on student's maturation and engagement with profession.[29,30]

Importantly, there is a need for an urgent action. Over the next few years, it would be required of a medical student applying for ECFMG certification to have graduated from a medical school accredited by an agency recognized by WFME. One of the major standards of WFME is an integrated medical curriculum (www.ecfmg.org/accreditation). A curricular change from a traditional curriculum needs preparation time of at least two-to-three years,31 including faculty development, and hence the time for action is now!

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