EDITORIAL

Bridging the Gap: The Need to Integrate Basic and Clinical Sciences in Undergraduate Medical Education

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The foundation of a medical school's curriculum is largely dependent on producing medical practitioners with the capability to manage a variety of clinical conditions with a holistic approach. Apparently, this is a straightforward goal, but it requires a synthesis of a wide range of information and expertise in clinical skills. The most effective way to achieve the target is through an integrated curriculum that provides foundational knowledge in a clinically contextualised setting [1].

However, till today, an isolation of basic and clinical sciences in the undergraduate medical curriculum is still a predominant and sometimes overlooked problem. A space has been created by the orthodox compartmentalised education of anatomy, physiology, biochemistry, and other core sciences that are disengaged from their therapeutic application [2]. A lacuna has therefore been created between the knowledge that students seek during their pre-clinical years and the clinical skills that they necessarily need to acquire during their clinical rotations.

Medical students, during their exposure to real-life clinical situations, often find it difficult to remember the fundamental concepts that they had learned during their pre-clinical years [3]. This cognitive disengagement results from an educational scenario where the subjects are taught separately, often in much detail, and occasionally integrated with the clinical scenarios. This fragmented learning wears down the important concepts needed for lifelong medical competency and obstructs the learners from developing their clinical reasoning skills [4]. Foundational knowledge, when delivered in context to clinical practice, becomes more meaningful for the learners. A study conducted by Sakles *et al.* reported that 86% of 4th year medical students in their clinical clerkship acknowledged that integrating basic science knowledge in relation to clinical scenarios has a profound impact in reinforcing understanding by adopting constructive learning [5].

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Received: August 27, 2025; Revised: September 22, 2025; Accepted: September 25, 2025
DOI: https://doi.org/10.37184/jlnh.2959-1805.3.39

IMPACT OF FRAGMENTED LEARNING

There is a far-ranging impact of disengagement between the disciplines of basic sciences and their link with clinical disciplines. Student disengagement is frequently observed if the curriculum fails to deliver the comprehension of what the students are learning in relation to the clinical scenarios [6]. The given knowledge, if not actively applied in a clinical context, can be quickly forgotten. Unsafe clinical practices and subpar diagnostic capabilities could potentially be the end product as a consequence of this fragmented learning [2].

INTEGRATION AS A PATH FORWARD

Redesigning the curriculum is now the need of the day. Integration in its true essence involves spiral integration, which is a blended form of learning of basic sciences subjects with applied aspects around organ systems of the body thematically [7]. In a very similar way, connecting the foundational subject with respective clinical subjects, which is what is labelled as vertical integration, is required to develop a multidisciplinary approach among the learners [8]. This creates a collaborative mindset in the students, which greatly improves clinical reasoning and develops a holistic approach while treating the patients. The clinical faculty could have a vital part in this regard by underlining the practical knowledge of basic sciences in the context of real-life clinical situations.

The addition of various teaching strategies such as problem-based learning, team-based learning and case-based learning can enhance understanding of the application of basic sciences with a clinical context. This will facilitate the clinical faculty to transfer clinical knowledge in a better way. The literature has shown that using an integrated curriculum can bring a positive outcome in terms of understanding the core concepts, which improves learners' outcomes, thereby facilitating them to take up their clinical roles in a better way during their undergraduate medical education [9]. A survey conducted on the students of preclinical years who were exposed to an integrated curriculum revealed that this exposure has added an enriched learning environment for them, and they are able to apply relevant clinical

knowledge from the very beginning of their pre-clinical years [10].

In light of the above discussions, it is suggested that to modify the existing curriculum, the following steps are needed:

1. Modifications in the curriculum by developing a curriculum reform committee, which should comprise both basic and clinical science faculty.
2. The tools regarding the assessment must be redesigned to incorporate more skills compared to rote memorisation.
3. Utilising skills lab and using simulation-based teaching by bridging the theoretical and practical knowledge in a controlled environment.
4. Incorporation of artificial intelligence in teaching and learning creates an immersive environment for a tech-savvy generation.
5. Faculty training to implement integrated teaching for the students.
6. Continuous feedback from the students is necessary in order to understand the problem and its solutions.

FUTURE DIRECTIONS

Research should be planned in future to investigate the long-term impact of an integrated curriculum on learning retention, decision making in a clinical scenario and eventually patient care. Further analysis is also required in the methods and content of assessment, faculty development and students' viewpoint in this regard.

Worldwide, medical education is transitioning towards a more integrated and clinically oriented curriculum. A less effective learning outcome is experienced in students as a result of the traditional curriculum. Many medical institutions across Pakistan are not practising integrated curriculum in its true sense, raising a thought-provoking question: Are we heading in the right direction?

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