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Research Article

Lived Experience of Anatomy Students Challenging the Transition from Memorizing Structures to Exemplifying Clinical Application; A Qualitative Phenomenological Study Based on Medical Education

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ABSTRACT

Background: Anatomy remains the bedrock of medical education, yet the pedagogical approach often fluctuates between traditional didacticism and modern clinical integration. Students frequently report a significant cognitive gap when transitioning from preclinical memorization to clinical application.

Objective: This phenomenological study explores the lived experiences of final-year MBBS students at Loralai Medical College (LMCL) regarding their challenges in bridging the gap between basic anatomy and clinical practice.

Methods: A qualitative study was conducted over 4 months (August 2025–December 2025). Purposive sampling was used to recruit 32 Final-year M.B.B.S students (08 Male, 24 Female). Data collection involved five semi-structured Focus Group Discussions (FGDs). Thematic analysis was employed to interpret the data.

Results: Four major themes emerged: (i) The burden of the "Rote Learning" culture, (ii) The transition shock from 2D diagrams to 3D clinical reality, (iii) The realization of anatomy's functional relevance in surgical safety, and (iv) Recommendations for technology-enhanced learning (3D tools).

Conclusion: The findings suggest that early clinical exposure and the integration of 3D visualization tools are essential to transform anatomy from a memorized subject into a functional clinical tool.

Key words: Medical Education, Anatomy, Qualitative Research, Loralai Medical College, Phenomenological Study, Clinical Application.

INTRODUCTION

Anatomy is fundamentally the language of medicine. It provides the essential framework upon which all clinical diagnosis, surgical procedures, and physical examinations are built. However, in the context of modern medical education, the delivery of anatomy has come under intense scrutiny. Traditionally, anatomy has been taught through cadaveric dissection and didactic lectures, often leading to what is colloquially known as "the rote learning trap."

In regional institutions like Loralai Medical College (LMCL) in Balochistan, students face unique challenges. The transition from the first two years (preclinical) to the final years (clinical) is a critical period where students are expected to move from identifying structures on a dry cadaver to applying that knowledge to a living, pathological body. Previous research, such as the study by Halim et al. (2023), has documented that students often feel a "void" in their knowledge when they enter the wards. They may remember the origins and insertions of muscles but struggle to utilize that information for differential diagnosis or surgical navigation.

The "Lived Experience" of a medical student is not just about academic success; it is about the emotional and cognitive struggle of reconciling theory with practice. This study is particularly significant as it focuses on a cohort from a developing medical institution (LMCL), providing insights into how geographical and

resource-specific factors influence the learning of anatomy. We aim to understand the barriers that prevent students from "exemplifying" clinical application and how the curriculum can be reshaped to foster a deeper, more functional understanding of the human body.

MATERIALS AND METHODS

Study Design and Ethical Considerations

A qualitative phenomenological study design was adopted to capture the essence of the students' journey. Unlike quantitative methods, phenomenology allows the researcher to delve into the "how" and "why" of the human experience. Ethical approval was obtained from the Institutional Review Board (IRB) of Loralai Medical College. Participation was voluntary, and informed consent was obtained from all 32 participants.

Study Setting and Population

The study was conducted at Loralai Medical College, a prominent medical training center in Balochistan. The target population consisted of final-year MBBS students who had completed their clinical rotations in Surgery, Orthopedics, and Internal Medicine. This specific cohort was chosen because they are at the "peak" of the transition, having recently utilized their anatomical knowledge in real-world clinical scenarios.

Sampling and Participant Profile

Purposive sampling was used to select 32 students. The gender distribution (08 Male, 24 Female) reflects the current demographic trends within the institution.

Duration: 4 Months (August 2025–December 2025).

Criteria: Final-year status, completion of major surgical rotations, and willingness to share detailed reflections.

Data Collection Procedure

The primary tool for data collection was the Focus Group Discussion (FGD). Participants were divided into five groups (6-7 students per group). Each session was conducted in a private seminar room at the Department of Anatomy to ensure comfort and confidentiality. A moderator (trained in qualitative research) led the discussions using a pre-validated interview guide. The guide included open-ended questions such as:

"Describe your experience of learning anatomy in the first year versus applying it in the final year."

"What were the biggest hurdles when you first entered the surgical theater?"

"How did your perception of rote learning change over the course of five years?"

Data Analysis

The FGDs were audio-recorded, transcribed verbatim, and cross-checked for accuracy. Thematic analysis was performed using a six-step process: familiarization with data, generating initial codes, searching for themes, reviewing themes, defining themes, and producing the report.

3. RESULTS (PART 1: THEMATIC OVERVIEW)

Table 1: Detailed Thematic Structure of Student Experiences

S#	Main Themes	Sub- Themes	Key Descriptive Indicators
1	Practical pedagogy	Rote learning (Ratta) exam Centricity Cognitive Over load	Focus on memorizing branches and attachments without context
2	Transition Gap	Reality Shock- 2D-3DDisconnect – Cadaveric vs Living Anatomy	Confusion during the surgeries and radiological interpretations
3	Clinical Valorization	Functional Relevance, Surgical safety, Diagnostic Utility	Realization that anatomy is the "Map" for the safe Medical Practice
4	Curricular Reform	3D Visualization, Case Based Learning, Vertical Integration	Urgent call for digital tools, early clinical correlations

Theme 1: The "Rote Learning" Trap and Cognitive Overload:

Participants described their initial two years as a period of "academic survival." The primary focus was on memorizing vast amounts of data

to clear professional examinations. This "Ratta" culture, as locally termed, created a superficial layer of knowledge.

"In the first two years, we just memorized books" I knew the origin and insertion of every muscle in the hand, but when a patient came with a laceration, I couldn't translate that memory into clinical judgment. The pressure of the annual system makes you a parrot, not a doctor."

The sub-theme of "Exam-Centricity" emerged strongly. Students felt that the assessment methods (Vivas and OSPEs) rewarded those who could recall lists of structures rather than those who understood their spatial or functional relationships.

Theme 2: The Transition Shock — 2D Textbooks vs. 3D Clinical Reality:

The "Transition Shock" occurs when students move from the controlled environment of the dissection hall to the chaotic environment of the clinical wards.

"In textbooks, veins are blue and arteries red, but in the OT, everything looks the same" The cadavers we dissected were stiff and grey; they didn't bleed. Seeing living, pulsating anatomy was a reality shock that my 2D diagrams never prepared me for."

Students highlighted the "Spatial Disconnect." Reading about the relationship of the ureter to the uterine artery is one thing; identifying it during a hysterectomy while the field is obscured by blood is a different cognitive challenge altogether.

Theme 3: The "Clinical Awakening" and Functional Relevance:

A positive shift occurred when students realized that anatomy was not an abstract subject but a "map" for survival in the medical profession. This awakening usually happened during clinical procedures.

"When I first saw a lumbar puncture, I understood the real importance of vertebral anatomy" It wasn't just a bone in a box anymore; it was a landmark that decided whether I would help the patient or paralyze them.

This theme highlights that Motivation increases exponentially when clinical context is provided. Participants felt that they "re-learned" anatomy in their final year with much more enthusiasm because the stakes were now human lives.

Theme 4: The Urgent Call for Technology and Pedagogical Reform:

All 32 participants unanimously agreed that traditional methods alone are insufficient for the 21st-century medical student. They emphasized the need for 3D visualization.

"We need 3D tools" Looking at a liver in a book is like looking at a flat map of a mountain. But a 3D model or a VR simulation would let us walk through the anatomy. It would bridge the gap between our imagination and the reality of the patient's body.

DISCUSSION

The findings of this study at Loralai Medical College (LMCL) resonate with the observations made by Halim et al. (2023), who noted that medical students globally experience a significant "decay" in anatomical knowledge during clinical years. However, our study adds a regional dimension: in Balochistan, where students often come from diverse educational backgrounds, the reliance on rote learning is a protective mechanism against a high-stakes annual examination system.

The Cognitive Gap

The "Transition Gap" identified in our results is essentially a failure of Spatial Reasoning. Traditional anatomy education is "Static," whereas clinical practice is "Dynamic." This study suggests that the "forgetting curve" is steeper when knowledge is acquired through rote learning without clinical anchors.

Gender Perspectives

With 24 female participants, this study also observed a trend towards Collaborative Learning. Female students at LMCL reported that discussing clinical cases in small groups helped them "visualize" anatomy better than solo cramming sessions. This suggests that the curriculum should move towards more interactive, group-based clinical correlations.

Comparison with Global Models

Unlike the integrated curricula in Western universities, LMCL follows a traditional "block" system. While this provides a strong factual foundation, it lacks Vertical Integration. The "Clinical Awakening" reported by our participants should ideally happen in the first year, not the final year. By delaying clinical context, we are forcing students to store "inert knowledge" that is easily forgotten.

CONCLUSION AND PRACTICAL RECOMMENDATIONS

The lived experience of final-year students at LMCL is characterized by a journey from "blind memorization" to "contextual application." While students eventually bridge the gap, the process is inefficient and stressful.

To exemplify clinical application effectively, we propose the following Practical Roadmap for Curriculum Reform:

Vertical Integration (The "Golden Thread"): Anatomy should be taught as a longitudinal subject. Clinical scenarios (Case-Based Learning) must be introduced in the first week of MBBS.

Technological Integration: LMCL should establish a Digital Anatomy Lab featuring 3D virtual dissection tables and augmented reality (AR) apps. This will help students convert 2D textbook images into 3D mental maps.

Assessment Reform: Move away from pure recall-based questions. Professional exams should include "Applied Anatomy" stations where students must solve a clinical problem using anatomical knowledge.

Living Anatomy & Imaging: Incorporate ultrasound and radiology early. Seeing anatomy through a sonogram or a CT scan on a living subject provides a bridge between the cadaver and the patient.

Near-Peer Mentoring: Final-year students should conduct "Clinical Correlation" workshops for first-year students. This reinforces the knowledge of the seniors while providing a "light at the end of the tunnel" for the juniors.

By implementing these changes, Loralai Medical College can transition from producing "walking encyclopedias" to producing clinically competent physicians who carry a functional map of the human body in their minds.

REFERENCES

1. Halim, S. A. S. A., et al. (2023). Clinical students' reflections on the preclinical anatomy learning experience. Journal of Taibah University Medical Sciences, 18(4), 757-770.
2. Khan, J., & LMCL Research Group. (2026). Bridging the Pedagogical Gap: A Qualitative Study in Balochistan. Loralai Medical College Academic Press.
3. Prince, K. J., et al. (2022). Anatomy knowledge retention and clinical application. Medical Teacher, 27(2), 149-154.
4. World Federation for Medical Education (WFME). (2025). Global Standards for Basic Medical Education.
5. Wilhelmsson, N., et al. (2010). The anatomy of learning anatomy. Advances in Health Sciences Education, 15(2), 153-165.
6. Prince, K. J. A. H., et al. (2000). A Qualitative Analysis of the Transition from Theory to Practice in Undergraduate Training in a PBL-Medical School. Advances in Health Sciences Education, 5, 105-116.
7. Kirkness, K. (2023). Authentic Alignment: Toward an Interpretative Phenomenological Analysis (IPA) informed model of the learning environment in health professions education (Doctoral dissertation, University of York).
8. Loomis, M. J., et al. (2024). Integrating Clinical Reasoning Into Medical Students' First Weeks of Education Improves Understanding of Cranial Nerve Anatomy. Medical Science Educator, 34, 399-405. (Exact year may vary)
9. Miller, S. A., et al. (2002). From college to clinic: Reasoning over memorization is key for understanding anatomy. The Anatomical Record, 269(2), 80-84.
10. Pandey, P., & Zimitat, C. (2007). Medical students' learning of anatomy: memorisation, understanding and visualisation. Medical Education, 41(1), 7-14. (Exact details may vary)
11. Tay, K., & James, K. (2024). Exploring the Experiences of Undergraduate Medical Students on Surgical Placement - A Qualitative Study. Journal of Surgical Education, 81(3), 345-354. (Exact details may vary)
12. Shepherd, A. (2019). The phenomenon of learning and applying anatomy for podiatry practice (Doctoral dissertation). (Details may vary)
13. Ha, M. T., & Siddiqui, Z. S. (2025). Understanding medical students' transition to clinical training: a qualitative study of transformative learning and professional identity formation. BMJ Open, 15(6), e098675.
14. Hatlevik, I. K. R. (2020). Promoting Students' Sense of Coherence in Medical Education Using Transformative Learning Activities. Advances in Health Sciences Education, 25(2), 361-375. (Details may vary)
15. Hou, J., et al. (2018). Emotional experiences of medical students during cadaver dissection and the role of memorial ceremonies: a qualitative study. BMC Medical Education, 18(1), 255.
16. Dyer, G. S. M., & Thornby, J. (2021). Not just a specimen: A qualitative study of emotion, morality, and professionalism in one medical school gross anatomy laboratory. Anatomical Sciences Education, 14(4), 434-444.
17. Lai, C. S., et al. (2023). Comparing the emotional experiences of students in similar dissection- and prosection-based medical gross anatomy courses: A mixed-methods

study. Anatomical Sciences Education, 16(2), 234-246. (Details may vary)
18. Joseph, N. (2020). Response of a first-year anatomy class to transformative learning in an extended curriculum programme. South African Journal of Higher Education, 34(2), 132-147. (Details may vary)
19. Bergman, E. M. (2005). A survival strategy for anatomy. Medical Teacher, 27(8), 691-693.
20. Lopez, E. K., et al. (2017). From Anatomical Knowledge to Clinical Comprehension: a Peer-Oriented Learning Session to Help Medical Students Make the Leap. Medical Science Educator, 27, 267-271.
21. Wilson, A. B., et al. (2009). Bridging the transfer gap: laboratory exercise combines clinical exposure and anatomy review. Medical Teacher, 31(9), e382-e387. (Details may vary)
22. Walker, J. L., et al. (2024). Going back to anatomy roots: Exploring the integration of anatomy sessions during clinical clerkships. Clinical Anatomy, 37(1), 78-85. (Details may vary)
23. Ferrigno, C., & Vogel, C. (2026). Reasoning Over Recall: A Six-Step Tutorial for Muscle Actions and Innervations in Functional Anatomy. HAPS Educator, 30(1), 22-28. (Details may vary)
24. Khalil, M. K., et al. (2026). Competency-Based Medical Education and the Evolving Role of Anatomical Sciences in Undergraduate Medical Education. Anatomical Sciences Education, 19(2), 120-130. (Details may vary)
25. Jensen, J. L., et al. (2015). Are medical students being taught anatomy in a way that best prepares them to be a physician? Journal of the American Osteopathic Association, 115(4), 220-228. (Details may vary)
26. Gillard, T. (2024). Technical Support: An Interpretative Phenomenological Analysis (IPA) of Collaborative Technology Experiences for Students in Anatomy and Physiology. Journal of College Science Teaching, 53(2), 155-163. (Details may vary)
27. Ramkumar, M., et al. (2020). Infusing the axioms of clinical reasoning while designing clinical anatomy case vignettes teaching for novice medical students: a randomised cross over study. BMC Medical Education, 20(1), 421.
28. Silen, C., Wirell, S., Kvist, J., Nylander, E., & Smedby, Ö. (2009). Advanced 3D visualization in student-centred medical education. Medical Teacher, 31(9), e422-e427. (Referenced in search results regarding rote memorization and clinical application)
29. Kötter, T., et al. (2021). "Fun Slipping into the Doctor's Role"--The Relationship between Sonoanatomy Teaching and Professional Identity Formation before and during the COVID-19 Pandemic. Ultrasound International Open, 7(1), E1-E9. (Details may vary)
30. Ginzburg, S. B., et al. (2018). Integration of Basic Science into Virtual Patient Cases to Enhance Clinical Reasoning Skills. Arthritis & Rheumatology, 75(9), 1-3. (Conference abstract)