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ABSTRACT BOOK

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Effect of Three-Dimensional (3D) Model-Assisted Teaching on Inguinal Canal Anatomy Comprehension Among Undergraduate Medical Students: A Randomised Controlled Trial

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ABSTRACT

Introduction: Effective anatomy education requires teaching approaches that support students' understanding of complex spatial relationships while maintaining sound pedagogical principles. Physical three-dimensional (3D) models are increasingly used as supplementary tools to enhance visualisation and active learning. The inguinal canal is a clinically important but conceptually challenging anatomical structure for undergraduate medical students to comprehend through lectures alone. This study aimed to evaluate the effectiveness of 3D physical model-assisted teaching in improving undergraduate medical students' understanding of inguinal canal anatomy compared with traditional lecture-based teaching. **Materials and Methods:** A randomised controlled trial was conducted involving 140 Year One medical students at the International Islamic University Malaysia. Participants were randomly assigned to either a lecture-only group or a lecture combined with 3D physical model-assisted teaching group. Knowledge acquisition was assessed using pre-test and post-test evaluations administered one week apart. Student performance in applied anatomy was further evaluated using structured practical assessment. **Results:** 107 students completed both assessments, giving a response rate of 76.4%. Both groups demonstrated significant improvement between pre-test and post-test scores (lecture-only: $p = 0.010$; lecture + 3D model: $p < 0.001$). Domain-specific analyses revealed that 3D models particularly enhanced performance in applied anatomy tasks assessed through the Objective Structured Practical Examination (OSPE). **Conclusion:** 3D physical model-assisted teaching enhanced students' understanding of inguinal canal anatomy beyond conventional lectures alone. Incorporating ethically appropriate, non-digital educational innovations as complementary tools may strengthen spatial learning and support effective anatomy education in undergraduate medical training.

Keywords: Anatomy education; inguinal canal; medical education; three-dimensional models; undergraduate medical students