Exercising the role of three-dimensional models in medical student understanding of high yield embryology topics

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METHODS

• Participants will be first year medical students at the Brody School of Medicine. 20-25 students total is ideal, but more sessions can be added if there is interest.
• Recruitment of participants via social media and other first-year forums
• Sign up via Google Docs for a session time slot
• Each group consists of 5-7 participants
• Data collection: two sets of data will be gathered at the time of the group session.
  • Pre-session multiple-choice quiz given to assess student understanding of the topic before using three-dimensional models
  • Post-session multiple-choice quiz given directly after the session to assess student understanding after using three-dimensional models
• Survey of student opinions about the teaching method, also given directly after the session

Curriculum design: anatomy and embryology course hours are heavily skewed in favor of anatomy—167 vs 16 hours, respectively (Drake et al., 2002)
Relevance:
• Anatomy and embryology comprise 11-15% of the USMLE Step 1 exam (USMLE, 2020)
• Prevalence of neural tube defects as high as 10 per 1,000 pregnancies (Greene, 2014)
• Prevalence of congenital heart defects is 8 to 10 per 1,000 live births (Gilboa, 2016)
• Models have been shown to:
  • Increase assessment scores (Chekrouni, 2019; Preece et al., 2013)
  • Improve long-term knowledge retention (Marsh et al., 2008)
  • Resonate positively with students (Chekrouni, 2019)

EVALUATION PLAN

• Data analysis
  • Pre-session and post-session quizzes will be graded for correctness
  • Means of each will be calculated and compared across the two sets
  • Statistical analysis will be conducted to determine if difference between means is significant
  • Survey questions will be given on 5-point Likert scale and frequencies of each response (ie, "strongly agree," "agree," etc) will be calculated

POTENTIAL IMPACT

Potential for:
• Increase in student understanding of embryological development and greater understanding of its clinical relevance
• Reinforcement of lecture-based material using easy to visualize models
• Long-term retention rather than memorization of material

REFERENCES