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OPEN PEER REVIEW

Design and Development of Electronic Moulage of Brachial Plexus Muscles to Enhance the Learning of Upper Limb Anatomy: An Interventional Study

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About this report

This open peer review (OPR) report shows the public comments made on this article during peer review, by the reviewers, the associate editor and the editor-in-chief, for every revision round, together with the authors' replies. Comments appear only with the consent of the people who wrote them. Reviewers who chose to sign their report are named; the others are shown as "Referee". Comments are edited for language only, and confidential remarks to the editors are not included.

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1 Original submission

1 comment · 1 Nov 2023

Referee 1 Reviewer

MINOR REVISION 1 Nov 2023

Uploaded in the attached file.

2

Revision 1

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Dear Chief Editor of Journal of Medical Education

Hi,

Respectfully, thanks to the comments on Manuscript ID 142466 with the title: " Upper limb electronic moulage: a novel simulator in brachial plexus training and upper limb muscles ".

The modified text (the parts to be modified are highlighted) and the responses to the comments are sent one by one in the "Reviewers responses" file.

Reviewer Comments:

Reviewer 1 comments

It seems that it is better to use the word simulator in the keywords.

Response: The word "simulator" was added to the list of keywords.

Please recheck line 124, it seems that your intended meaning is incomplete.

Response: line 124, checked and corrected.

It is better to revise the manuscript in terms of grammar and writing.

Response: The text was checked and corrected for grammar and typing.

Reviewer 2:

Uploaded in attachment file.

Response: **Unfortunately, we could not download any file in the attachment, probably the file uploaded by the respected referee was not complete.**

Thank you for your cooperation in anticipation.

Sincerely.

Corresponding Author: Dr. Mohsen Akbaribazm, Department of Basic Medical Sciences, Khoy University of Medical Sciences, Khoy, Iran.

2 Revision 1

0 comments

No public comments in this round.

3

Revision 2

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Response letter

Dear reviewers of the "**Journal of Medical Education**."

Greetings of the day. On behalf of all authors, we have special thanks for your time reviewing our manuscript and helping us to improve our study based on your valuable comments. We appreciate it. We considered all the statements of both the reviewers and editorial board, revised the manuscript, highlighted the changes in yellow, and mentioned all amended parts as a response letter in the following text. We hope the revised manuscript is qualified for publication in this treasured journal.

Comments of the respected reviewers	In response to your comment
1-The title does not indicate the study's design	Design and Development of Electronic Moulage of Brachial Plexus Muscles to enhance the learning of upper limb anatomy: An interventional study
2- In the abstract, before the objective of the study, give a very short background of the subject	**Objectives:** Anatomy embraces various fields and is regarded as the foundation of medical sciences due to its broad clinical applications, particularly in surgery. However, teaching this subject, particularly in practical units, poses challenges and**.** insufficient anatomical knowledge and errors in anatomy-related decisions by physicians can lead to avoidable deaths and medical errors. This study aimed to design and develop an electronic moulage (EM) for teaching upper limb anatomy, specifically focusing on the muscles and brachial plexus (BP).
3- Mention the study design in the method part of the abstract	**Methods:** This was a quasi-experimental study with a pretest-posttest design. EM has been implemented in a manner that allows independent structures within a compartment to be taught without the presence of a teacher or anatomical atlases and enables learners to comprehend the anatomical features and relationships of structures in both combined and isolated modes, even without prior knowledge of anatomical theory specific to that compartment. The EM incorporates a skeletal compartment system and a BP component, utilizing audio and visual systems to deliver a comprehensive educational experience. The effectiveness of the EM was evaluated by experts in anatomy and medical science students, comparing it to other teaching methods. Four groups of undergraduate medical radiology students, with no prior instruction in upper limb anatomy, participated in the study. Each group was assigned to a different training method, including

	lecture-based education, digital-based education with a simulator, cadaver-based education, and EM-based education.
4- In the method part of the study, explain about study design, designing and developing of EM	**EM design and performance** This was a quasi-experimental study with a pretest-posttest design. The first brachial and lumbar network moulage for student education was created by this research team in 2018 and was used in anatomy practical classes for medical students, especially radiology students. After that, in 2019, a brachial network moulage was created next to the axillary artery. Positive feedback was received from students after training, and understanding of the nervous system became easier for them. Finally, this team decided to create an electronic brachial network moulage alongside the muscles to facilitate learning for students. As mentioned earlier, EM has addressed the limitations of traditional moulages in the field of anatomy education and has been implemented in a manner that allows independent structures within a compartment to be taught without the presence of a teacher or anatomical atlases. This is achieved through the integration of auditory, visual, and mechanical systems in the EM, enabling learners to comprehend the anatomical features and relationships of structures in both combined and isolated modes, even without prior knowledge of anatomical theory specific to that compartment. In contrast, traditional moulages always require the presence of a teacher and anatomical atlases, as well as prior understanding of anatomical theory. Moreover, traditional moulages often overlook the anatomical performance of structures and their natural surroundings. Another advantage of EM is its ability to enhance motivation in anatomy learning.
5- Explain about the validation of assessment taken from students 6- Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	In this study, we utilized four independent, random, and homogeneous groups of undergraduate medical radiology students (80 students; 20/group) with an average age of 19.4±1.6. The students in each group were admitted to the Bachelor of Radiology program in 2019-2020 academic year. All

	groups were in their first semester of radiology and had not received any instruction on upper limb anatomy.
7- Give the eligibility criteria, and the sources and methods of selection of participants.	All participants were assessed before (pretest) and immediately after the intervention (posttest), using the Questionnaire of Anatomy's Knowledge. The inclusion criteria for the present study were interested in participating in the research and completing a course in the anatomy of Brachial Plexus Muscles. Exclusion criteria for participants included refusal to proceed with the research, failure to attend an educational session, and failure to complete the research instruments in the second phase of data collection. Informed consent was obtained from all participants. They were assured that their personal information would be kept confidential and only general statistics and data would be published. This project was approved by the Ethics Committee of EDC of Torbat Heydariteh University of Medical Sciences.

3 Revision 2

0 comments

No public comments in this round.