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Letter to Editor

Peer-research learning and mentoring for undergraduate medical students: Benefits and challenges

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Dear Editor,

Today, research efficiency is a critical element not only for scientific institutions but also for governments. Previous studies indicate that outstanding high-impact research requires the collaboration of professional researchers and teams of experts.[1] An essential step toward establishing expert researchers and professional research teams involves the collaboration of a professional instructor to train and guide the learners during their research process.[2] On the other hand, peer learning, peer education, and peer mentoring should not be neglected in this field of education, teaching, and learning, as well as training.

Despite inadequacy in standard research courses for undergraduate students, experiential learning and mentorship can significantly improve the quality of research by inculcating a research culture among junior students.[3] Evidence suggests that peer-research education and mentoring can have beneficial effects on undergraduate students, although Lev et al. defined mentoring as occurring when: "…a senior person or mentor provides information, advice, and emotional support to a junior person or student over a period of time."[4] Therefore, this letter investigates the benefits and challenges of peer-research learning and mentoring for undergraduate medical students.

First, it is necessary to develop a course protocol outlining how teaching, learning, and training will occur to establish a standard training program. According to standard research training courses and protocols, several main topics are necessary for understanding how to conduct research, including conceptualization of priority research problems, development of fundable research proposals, ethical data collection, data analysis and evaluation of results, manuscript writing, and dissemination.[5] A peer undergraduate medical student who has handled some research projects, published several articles, presented at conferences, and is generally recognized as a researcher, can identify and fill in gaps in the previous protocols. Nevertheless, since developing protocols requires expertise in a specific field, an undergraduate medical student, as a peer with trainees, may have to seek guidance from senior experts before writing course protocols.[6]

For the second step, it is necessary to transfer information and teach theoretical topics. As a result of previous experiences and studies, peer-to-peer teaching and learning both offer more benefits than limitations. Specifically, peer-to-peer learning helps students improve their attitudes toward education, foster a more personalized learning experience, participate in cooperative learning, and contribute to higher academic achievement. In addition, peer teachers gain confidence, sharpen their skills, provide cost-effective training courses, and improve student teamwork.[7,8] In addition to these benefits, peer-to-peer learning may be limited or impeded by knowledge gaps among peers, although peers intend to control the atmosphere of the teaching course and competitive performance. In addition, peers may encounter other challenges due to their limited authority in certain areas.[9]

Research education requires theoretical and practical information; therefore, after course planning and the transfer of theoretical information, it is crucial to improve the research skills of the target teaching population. The practical training course aims mainly to review theoretical lessons in practice, share and transfer valuable experience, and encourage trainees to improve their skills. To the best of our knowledge and experience in the current study, peer-research mentoring can help students gain a deeper understanding of their contributions, encourage student-mentor interaction, and allow them to extend the duration of their research experiences. Furthermore, in previous studies, undergraduate medical students have expressed positive attitudes and perceptions toward peer-to-peer research mentoring, and similar peer-to-peer

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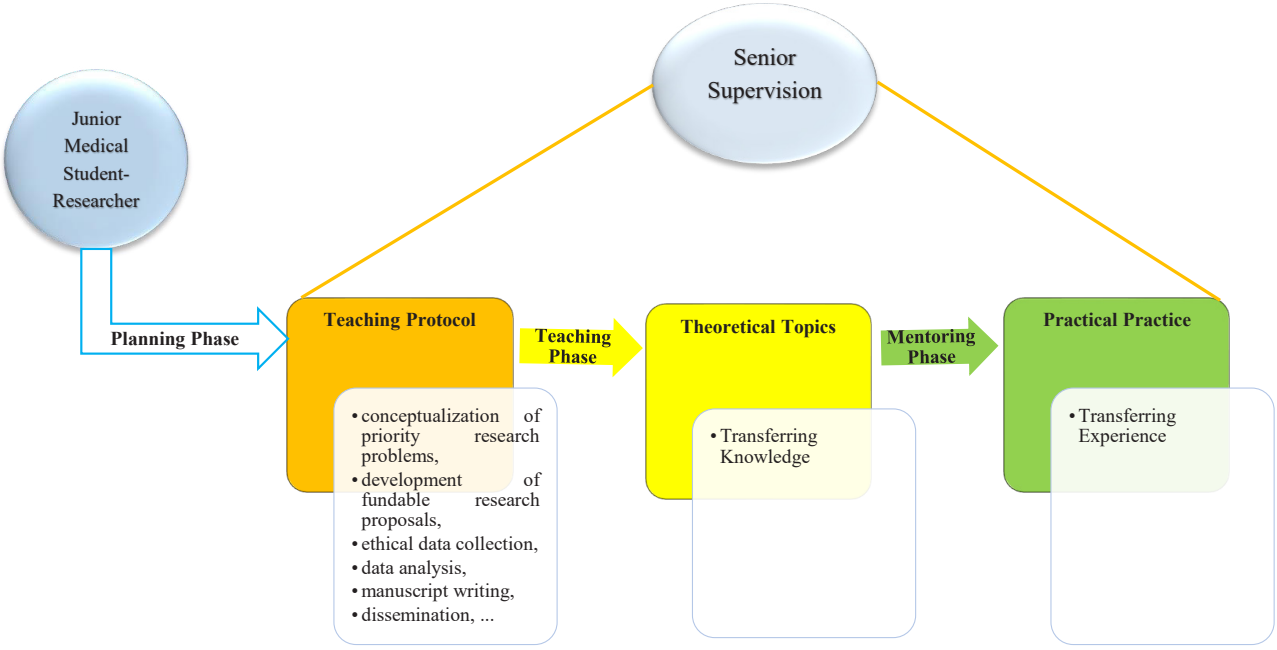

Figure 1. A summary of a potential peer-research learning and mentoring course.

mentoring programs generally resulted in acceptable outcomes for undergraduate medical students. However, it should be noted that the insufficient knowledge and experience of peers is one of the main limitations of using peer-to-peer research mentoring.[10] Despite various studies investigating the benefits, efficacy, and barriers of peer-research mentoring, many gray areas concerning peer-research learning and education need to be explored further to determine its effectiveness.

In conclusion, it can be argued that although several studies have investigated numerous aspects of peer-research mentoring, including its advantages, disadvantages, limitations, and barriers, further research is required both to identify gaps in this learning method and to improve it. Additionally, a more significant gap appears in this term, which refers to peer-research learning that aims to teach the conduct of peer research, especially for undergraduate medical students.

Similar courses can significantly affect trainees based on the information provided regarding peer-research mentoring. However, it is essential to resolve gaps, such as a lack of knowledge among peers. As a final observation, peer-research learning and education significantly affect undergraduate medical students from a theoretical perspective. As a result, based on the findings of the study of peer-learning benefits, it is highly recommended that research learning protocols be designed to help peers learn to teach and mentor others. It is worthwhile to note that the supervision of senior research may potentially contribute to improving the protocol development process (Figure 1).

Authors' contributions

MJ drafted the manuscript. AM developed the idea for this study and drafted the manuscript. All authors verified the final manuscript.

Availability of data and material

Data sharing does not apply to this article since no datasets were generated or analyzed during the current study.

Competing interests

The authors declare no conflict of interests.

Ethical approval

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