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LETTER TO THE EDITOR

Flexner's legacy and the future of medical education: Embracing challenge and opportunity

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Abstract

This editorial comments on the article by Alzerwi. We focus on the development course, present challenges, and future perspectives of medical education. Modern medical education is gradually undergoing significant and profound changes worldwide. The emergence of new ideas, methodologies, and techniques has created opportunities for medical education developments and brought new concerns and challenges, ultimately promoting virtuous progress in medical education reform. The sustainable development of medical education needs joint efforts and support from governments, medical colleges, hospitals, researchers, administrators, and educators.

Key Words: Medical education; Medical education reform; Abraham Flexner's report; Educational administration; Challenge and opportunity

Core Tip: Medical education is never invariable, but it keeps pace with the times and is constantly influenced by multiple factors. Reviewing the past and analyzing the present of modern education and medical practice will help move forward better and faster in the new era. The emergence of new ideas, methodologies, and technologies has created opportunities for the development of medical education and also brought new concerns and challenges worthy of contemplation and continuous exploration by every researcher, administrator, and educator concerned about the reform and development of medical education.

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TO THE EDITOR

Medical education is significant in promoting the sustainable and healthy development of health care, the primary way to cultivate qualified medical workers, and makes decisive contributions to the level and quality of medical and health services in a country or region. In addition, medical education also promotes the innovation and development of medical and health care to adapt to the progress of society and the economy. Meanwhile, modern medical education is global, with worldwide efforts to implement competency-based reform and innovations to address the issues arising during the education process and to meet local and international healthcare needs[1].

We are very interested in the original article by Alzerwi[2]. We consider this a qualified and enlightening study, as the authors reviewed multiple reforms for medical education in Abraham Flexner's seminal 1910 report and the evolution of the medical education system since the 19th century, enumerated current problems in medical education (terming them as returning to the pre-Flexnerian state), emphasized the importance of basic science, and suggested a return to Flexner's recommendations. This article would undoubtedly stimulate more interest and attention in medical education among researchers and educators, help solve current problems, and further adapt to the new situation and needs of global health care and medical education.

PROPOSAL AND DEVELOPMENT OF THE FLEXNER REPORT

In the late 19th century, education in most American medical colleges was still solely focused on imparting students the practical application of existing medical knowledge. A series of pioneers and institutions, including The Johns Hopkins University and its School of Medicine, proposed the particularity of medical education and gave rise to scientifically based medical education[3].

More than a century ago, Abraham Flexner visited and investigated 155 medical schools and then released the famous "Herculean Report on Medical Education in the United States and Canada" to the public in June 1910[4]. Flexner's report made numerous recommendations for medical education, including a solid scientific basis and the applications of pedagogical methods, and therefore had a profound impact on the reform and practice of medical education[5]. Despite some controversy[6,7], the report ushered in a new era in modern medical education.

For over a century, Flexner's report has undoubtedly facilitated the reform and development of global medical education and laid a solid foundation for training higher-quality medical talents. In recent years, there have been varying declines in the number of clinical researchers, bedside teaching, and faculty-supervised patient interactions, and contrary increases in student absenteeism and working hours in front of a computer, as Alzerwi[2] mentioned.

While raising these worries above, we also recognize that medical practice in the current era is dramatically affected by many factors, such as data science, new medical technology, medical policy, and demographic changes, and therefore, medical education also needs to be adjusted accordingly[8]. Meanwhile, multiple challenges and opportunities have arisen for medical education after the coronavirus disease 2019 (COVID-19) pandemic, including the exploding application of information technology, the rapid development of interprofessional education, and increasing concerns about health disparities worldwide[9]. Review the past to understand the present. While there is no guarantee that the current medical education reform and evolution will solve all of today's problems, it is believed that we are in the right direction in the present and future, led by many pioneers, including Abraham Flexner.

CHALLENGES TO CURRENT MEDICAL EDUCATION

Challenges to current medical education are multifaceted, and their reasons vary. In addition to the shortage of clinical researchers, the decrease in bedside teaching, the increase in student absenteeism, and the weakening of the teachers' role, which Alzerwi[2] has already mentioned, current challenges also include the weak inclusion of medical humanities, the continuous emergence and multiple impacts of new educational methodologies, and the reshaping of medical education

and practice models by new technologies.

The first aspect to consider is insufficient medical humanities in current medical education. Although many would disagree and may point out that numerous medical schools worldwide have already added medical humanities to undergraduate curricula, there is no denying the subordinate role of medical humanities in current medical education [10]. The current medical humanities education mainly acquires knowledge from humanities passively and lacks insight from medicine to humanities[11]. Not only that, even among medical humanities supporters, there is still a lack of consensus on the teaching content and pedagogy[12]. Meanwhile, although the importance of medical humanities in shaping students' empathy and positive values has been well acknowledged, medical interns may be confused by a series of disconnections between pre-clinical education and clinical practice, especially when witnessing compassion always outsourced to nurses. Therefore, the purpose of teaching medical humanities should not only be to introduce a specific known knowledge but to integrate medical humanities as a priority pattern of clinical thoughts and behaviors into medical students' future careers[13,14].

The second aspect is the emergence of various new pedagogical approaches and theories and their multiple impact. New teaching methodologies are mainly to adapt to the needs of medical and social developments. Although traditional teaching methods can help students learn medical concepts and theories comprehensively and systematically, they can neither satisfactorily consider the cultivation of practical ability and innovative thinking nor keep pace with the variation in global emerging diseases and education needs. In this context, a series of novel teaching methods, including problem-based learning, case-based learning, and task-based learning, gradually came into being and have revealed a positive influence on medical education[15]. However, recent studies have also shown that these new teaching methodologies are only used in a subset of medical schools and, in most cases, only for a small proportion of students[16]. The reasons for this are manifold, not only because the new teaching methods may not be suitable for every district, medical school, and student but also because of insufficient funding, relatively cumbersome processes, extra burdens for educators, and their resistance to the new methodologies[17]. In online teaching and clinical simulation teaching[18,19], which have gradually emerged since the COVID-19 era, there are also situations similar to the above where progress caused by new methodologies coexists with various influences that cannot be ignored. Therefore, we need not only to promote the latest methods to adapt to the needs of the new era and obtain better teaching results but also to carry out further research and continuously update these above methodologies.

The third aspect is new technologies reshaping medical education and practice models. First of all, the increasing applications of modern teaching platforms such as podcasts, social media, and video conferencing brought about by the development of digital technologies have made learning more attractive and interactive while also helping to overcome geographical constraints[20], which has been further developed since the times of COVID-19[21]. However, some researchers have claimed that digitizing medical education would reduce the difficulty of obtaining medical information and make medical professionals lazy and forgetful[22]. The next is the rapid development of artificial intelligence (AI) technology in recent years. AI can be applied in medical teaching implementation, teaching evaluation, and teaching feedback. Since AI technology has already and will continue to have a profound impact on medical practice in the future, medical education should pay more attention to the combination of man and machine in medical teaching and training and accordingly integrate AI technology into current education so that future medical professionals can better improve learning ability and clinical performance[23]. Although recent surveys have shown that most students hold positive perceptions of AI[24], the appropriate level of AI education for varied medical students may be a difficult decision for medical schools and educators[25]. Technological progress is a double-edged sword, and fear is understandable. However, resistance can not stop the pace of continuous technical development; only the brave embrace of new technology can help us remain irreplaceable in the unknown future.

In addition to these above challenges, there are still more unsolved problems, such as imperfect education systems, uneven education resources, lack of teaching team construction, unsatisfactory quality of student training, deficient training capacity for major infectious diseases, insufficient integration of multi-disciplines, and declining senses of professional honor. Although there seem to be plenty of problems, finding problems is the premise of analyzing and solving them, and it is also the only way to improve and progress medical education. Overall, we should have complete confidence in the future.

OPPORTUNITIES AND FUTURE PATH

Reference Citation Analysis (*RCA*, https://www.referencecitationanalysis.com/) is a unique artificial intelligence system for citation evaluation of biomedical literature. *RCA* was employed to analyze previous studies on medical education reform up to December 2023. Database retrieval has revealed that the published literature on medical education reform in the past five years has far exceeded those in the first decade of the 21st century. With the rapid development of high and new technology, the research of medical education reform has also ushered in a new peak. Where is the future of medical education headed?

It is foreseeable that medical education will usher in another remarkable development, especially with the application of artificial intelligence, virtual reality, telemedicine, and other technologies[26], providing more opportunities and possibilities for medical education. At the same time, international cooperation in medical education will be further strengthened along with the trend of globalization[27]. The world's advanced medical education concepts and methodologies will be promoted and applied more quickly than ever, contributing to the reasonable distribution of global medical education resources. Countries and regions worldwide will also continue to increase policy support and financial investment in medical education and create a suitable environment for the further development of medical education[28].

However, the path to the foreseeable future is uncertain and not unique. A timely review of the incompatibility between Flexner's recommendations and the current education practice is necessary and an important guarantee to continue the rapid development of medical education for more than a century. Meanwhile, we should recognize that reviewing the past is not for the sake of being confined to the past but for the sake of new development. It is also necessary to effectively combine the current world economic and social development and the updated medical practice needs, boldly innovate in the land of medical education practice, "plant new trees" with new methodologies and bear fresh fruits of development in the new era. In addition, the problem of student absenteeism mentioned in Alzerwi[2]'s article may not become a problem as medical schools may reduce their non-unique pre-clinical classroom training in the future[29]. In the meantime, although the specific development process may vary markedly in different regions[30], insufficient bedside teaching mentioned by Alzerwi[2] may also be alleviated with the popularization of artificial intelligence and virtual simulation teaching technology[31].

CONCLUSION

In the current coexistence of problems and opportunities, medical education in the new era has ushered in a unique and profound development opportunity. Under the updated medical needs requirements, with the help of high-tech and new teaching methodologies, medical education reform will go faster and better based on our predecessors.

FOOTNOTES

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