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Artificial Intelligence in Undergraduate Medical Education

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Abstract. AI will take on an increasingly important role in medicine. Therefore, AI competencies should be taught in medical school. We investigated the inventory of AI-related courses at German medical schools. The majority of faculty offer courses on AI, but mainly at the elective and introductory levels. Regarding the topic of AI, there is a gap in German medical education that should be closed.

Keywords. AI, medical education, qualification, competencies

1. Introduction

The increasing use of artificial intelligence (AI) in the medical field requires healthcare professionals who are able to work with the growing number of different medical AI systems, including the evaluation of their output and understanding of their limitations [1,2]. Medical students in Europe do not feel prepared for working in a digitalized healthcare system, and there is a need to include AI- and digital competencies more in medical education [3]. However, there is limited evidence on the status quo of educational programs in AI for undergraduate medical students in Europe.

We aimed to assess learning opportunities on AI at German medical schools.

2. Methods

In April 2021, following IRB approval [4], all 39 German medical faculties were consulted with an online questionnaire on AI-related learning opportunities. In addition, information on this was researched in publicly accessible sources (e.g. faculty websites, module handbooks etc.). Finally, all deaneries were asked to validate the compiled information; 29 of 39 institutions validated our information or completed the questionnaire themselves.

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3. Results

The majority (28/39, 71.8%) of medical schools in Germany offer AI-related courses to students, mostly as elective courses or extracurricular activities. About three-quarters (31/39, 79.5%) of institutions are planning (more) AI-related learning opportunities.

Most common are courses that provide an overview and introduction to the application areas of AI. At nine institutions, such courses are anchored in the core curriculum. Almost all (25/28, 89.3%) institutions with AI courses consider ethical, legal, and social issues of AI, as well as the special needs of communicating with patients using AI applications.

15 of 38 (39.5%) faculties reported having implemented courses on AI for the first time in 2020 or 2021.

4. Discussion

AI-related learning content is mainly present in voluntary courses, but hardly in the compulsory curriculum of medical studies. However, we see dynamic development in this area, with the majority of medical schools planning to introduce AI courses and a large proportion of learning opportunities introduced in the last two years.

5. Conclusions

Basic competencies in the field of AI are essential to enable physicians to supervise AI systems but are not taught comprehensively in medical training in Germany. They should become an integral part of the mandatory curriculum at medical school.

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