Survey - Artificial Intelligence in Medicine: the medical education point of view

We are a group of researchers from the Faculty of Medicine of the University of Porto, Portugal and we are surveying the different interests and beliefs of health researchers about Artificial Intelligence (AI) and its current and future applications in Medicine. AI is the study and design of intelligent agents, where an intelligent agent is a system that perceives its environment and takes actions which maximize chances of success (Bernstein RB, Curtis WN, Artificial Intelligence: New Research, 2009)

AI applications are used, in general, to make diagnosis, to monitor patients, create medical databases, to criticize and plan therapies, etc. It applies techniques such as clinical data mining, image processing, temporal data mining, probabilistic and Bayesian analysis, knowledge discovery in databases, knowledge-based health care, machine learning, information retrieval, decision support systems, etc. (Shortliffe Eh; AI in medicine comes of age: blossoming or languishing?; 2009).

Since the application of AI in medicine has experimented a significant growth in the last few years, several questions rise about its relevance, utility, efficacy, effectiveness and efficiency. In a convergent perspective, this group of questions became a single interrogation, which is our research question:

"Is Artificial Intelligence relevant and valuable for current and future applications in Medicine?"

We consider that it is important to investigate opinions expressed by universities concerning the future impact of this issue in research and education. This way, your contribute would be very meaningful, so we ask you to kindly try to answer all the questions we have prepared.

To complete the survey you should take no longer than 5 minutes. Data confidentiality will be preserved. Thank you!

1 - What is your main area of specialization?

☐ Medicine

☐ Medical Informatics

☐ Artificial Intelligence

☐ Other exact sciences (e.g. Mathematics, Computer Science, Engineering, etc.)

☐ Other social sciences (e.g. Economics, Management, Psychology, etc.)

☐ Other healthcare sciences (e.g. Nursing, Physiotherapy, etc.)

If your answer is "Other", please specify:_________________________
Impact of AI in medicine

2 - Have you ever used AI applications in your professional life?

☐ Yes
☐ No
☐ I am not sure

If your answer was “No”, please move on to question 3.

2.1 - In which of the following areas have you used AI applications?

☐ Decision support for Diagnosis
☐ Decision support for Prognosis
☐ Decision support for Treatment
☐ Data management
☐ Data monitoring
☐ Educational Applications
☐ Other

If your answer is "Other", please specify:__________________

2.2 - How do you classify the impact AI has made in that experience?

☐ Extremely negative
☐ Negative
☐ Neutral
☐ Positive
☐ Extremely positive

3 - In the future, do you expect to use AI applications in your professional area?

If your answer was “Definitely not” or “No”, please move on to question 4.

☐ Definitely not
No

Maybe

Yes

Definitely yes

3.1 – In which area would you like to use AI applications?

☐ Decision support for Diagnosis

☐ Decision support for Prognosis

☐ Decision support for Treatment

☐ Data management

☐ Data monitoring

☐ Educational Applications

☐ Other

If your answer is “Other”, please specify:____________________

4 – How do you classify yourself considering your experience in using AI systems?

☐ No experience

☐ Informed outsider

☐ Some experience

☐ Knowledgeable

☐ Expert

5 – How would you rate the relevance that your educational institution gives to the teaching of AI in Medicine?

☐ None

☐ Low

☐ Moderate

☐ High
5.1 - "My Educational Institution should give more relevance to the promotion of AI in medicine"

☐ I totally disagree
☐ I disagree
☐ I do not have a solid opinion
☐ I agree
☐ I totally agree

Future of AI in medicine

6- In your opinion, which is/are the medical area(s) of action on which it will make more sense to invest AI in?

☐ Decision support for Diagnosis
☐ Decision support for Prognosis
☐ Decision support for Treatment
☐ Data management
☐ Data monitoring
☐ Educational Applications
☐ Other

If your answer is "Other", please specify: ____________________

7– Tick one of the alternatives given in what concerns to the following statements:

7.1 – AI may be a great ally on the seeking of a more efficient treatment on healthcare institutions.

☐ I totally disagree
7.2 – AI may increase the distance between doctor and patient.

7.3 – AI applications demand a large initial financial investment.

7.4 – The use of AI can enhance medical education in numerous domains.

7.5 - The government should invest more on AI applications in Medicine.
7.6 - **Artificial Intelligence is relevant and valuable for current applications in Medicine.**

- I totally disagree
- I disagree
- I do not have a solid opinion
- I agree
- I totally agree

7.7 - **Artificial Intelligence is relevant and valuable for future applications in Medicine.**

- I totally disagree
- I disagree
- I do not have a solid opinion
- I agree
- I totally agree

7.8 - **I believe I can give a contribute to the development of AI in Medicine.**

- I totally disagree
- I disagree
- I do not have a solid opinion
- I agree
- I totally agree
8– What is the future scenario that you predict for the link between AI and Medicine? Do you believe that, nowadays, it is important to apply AI in Medicine? Why? What benefits may, from your point of view, come out of this association?


Personal information

Your information will be kept confidential and will only be used in the context of this study. The establishment of links between the information and opinion given above and some personal information will certainly improve our work. Thank you!

9 – Nationality: _____________

10 – Age: ____ years

11 - Year of completion of higher academic degree:___________

11.1 - Type of academic degree:

☐ PhD

☐ Master

☐ Post-graduated studies

☐ Other

If your answer is "Other", please specify:_________

12 - If your academic background is Medicine, please state your specialty:____________________

Thank you for your collaboration!