<u>Is Artificial Intelligence Beneficial to Healthcare?</u>

Krishan Patel
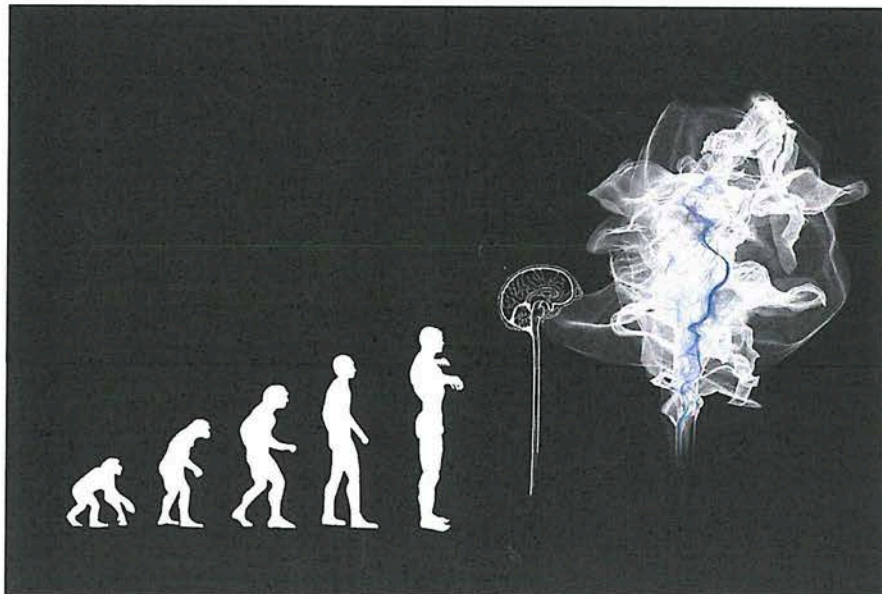
Contents

Introduction and Background

Artificial Intelligence, referred to as AI for short has been defined in many ways. Professor John McCarthy defines it as "the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable." (McCarthy, 2007)

This project explores AI and its application in healthcare. As AI continues to grow over the years, it has been applied to many fields including healthcare. I chose this project topic because the healthcare industry is so important; it saves people's lives. Everyone at some point in their life will have some interaction with healthcare, but what will that look like in ten to twenty years time? It remains unclear if AI will be able to take over the role of healthcare professionals and more broadly the healthcare industry.

As new technology rapidly advances, I am interested in knowing if AI would be able to analyse vast amounts of data, provide prescriptions, perform operations, diagnose conditions and function 24 hours a day seven days a week. Can AI offer all of this for the for the end goal to improve population health, improve the patient experience of care, reduce waiting times, and reduce the rising cost of care?

This project links to my other subjects because healthcare is related heavily around science, and computer science in the aspect of AI. These are both essential topics for the future. This project links to my future aspirations because I am really immersed in development and coding, and links to the wider context of healthcare and the healthcare sector.

The overall aim of this project is to explore if AI would be beneficial to healthcare? The objectives are:
1. To review the research from key areas
2. To conduct a survey to gather opinions from a range of healthcare professionals.
3. To summarise my findings through my discussion and conclusion.

Research Review

FutureLearn is a website with many articles on many different subjects. (FutureLearn, 2023) The writer of this specific article is anonymous, but in the company FutureLearn, currently being managed by Andrew Derek Hancock and published on May 2nd 2023. This is a secondary source and is open access. This source is relevant to my research question in that it states clear facts revolving around AI, its purposes, and the good and bad issues of it in our current time. From this research, I have learnt many pros such as how AI can improve analysing data, patient care, reduce cost of care, but also cons like how AI still needs human input to function. This source helps me place my research question into the wider context of the research area by expanding into AI in a healthcare environment and fully explaining all of the points made. The source scores 14/15 using the CRAAP method because it was written in May 2023 by FutureLearn. The source addresses my question and gives me useful information as it tells me

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what I want to know about the subject, and keeps it simple, not verging into non useful information. The organisation is well-known and partners with ¼ of the top worldwide universities to help make its articles. The source is trustworthy in that it showcases all of the sources it has used for the article. Finally, the purpose of the source is to educate young people around the world and transform access to education. Overall, this is a reliable source for academic work because it showcases a purely educational site that helped me do my research, hence why a 14/15 CRAAP test result.

some evaluation

reliability

An article on the potential for AI in healthcare was written by Thomas Davenport and Ravi Kalakote in June 2019 and published in a peer reviewed journal. (Thomas Davenport, 2019) This is a secondary source and is open access. The source is relevant to my research question in that it goes into applications that include AI and the potential advances in the field of medicine. From this research, I learnt about machine learning and what happens when it is used. For example, machine learning is fitting models with data so they can learn and get a specific answer for anything they are trained to do, as doctors will never get the most precise answer. They also dive into the neural network (helping with the categorisation of data) and deep learning (recognising complicated patterns in things given, quite like the human brain). It also goes into the implementation issues we can face when using AI and how they lack algorithmic systems that can constantly change with the flow of the healthcare system. This source helps me place my research question into the wider context of the research area by focusing on different types of AI there are in the healthcare industry, showcasing the downsides to them as well. This source scores a 14/15 using the CRAAP test and gives me useful information from 2019. The source addresses my question and gives me useful information as it focuses only on the topic of AI in medical practices, even showing examples of radiology using deep learning algorithms and how it has managed to get certain information out of the picture. The Author is known as a medical professional and the other one a technologist, meaning they are both very well equipped in the topic. The source is trustworthy in that it references or cites any information that has been taken. Finally, the purpose of this source is to educate and research more on an upcoming topic in healthcare, and the whole of nih.gov's purpose is to "seek fundamental knowledge about the behaviour of living systems, with the application of the knowledge enhancing health, lengthening life and reducing illness." Overall, this is a reliable source for academic work because anyone can use it and it is a purely educational site based around healthcare.

journal article

context + relevance

AO2

context linked to project

AO2

why used + reliability

Artificial intelligence in healthcare: transforming the practice of medicine is an article written by Junaid Bajwa (Chief medical scientist) Usman Minir,(research program manager) Aditya Nori (head of health intelligence), and Bryan Williams (chair of medicine) and was published in July 2021. (Junaid Bajwa, 2021) This is a secondary source and is open access. This source is relevant to my research question in that it goes into the various stages of AI being made, tested, it is impacts, along with statistics on the matter. For example, the implementation of AI requires design and developing, evaluation, diffusing and scaling (paying for updates on the model) and monitor and maintaining of the system (ensuring it produces accurate data, works 24/7) From this research, I learnt the advantages of drug discovery and precision medicine when AI is involved in it, and how it will be better for understanding disease and allows for a more systematic complexity of biology and making more advanced therapies at a lower cost, but also the disadvantages with jobs with AI applications, and how by 2030 (when analysing the need of the global population and current trends) it is estimated 18,000,000 less healthcare professionals will be in the industry. This source helps me place my research question into the wider context of my research area by giving me information about specific

online article

context + relevance

AO2

link to Q

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areas of the healthcare industry, while also being more generical by giving speculations on what will happen later (which helps me to explain how useful AI could be). The source scores 15/15 using the CRAAP method because it gives me key arguments from July 2021. The source addresses my question and gives me useful information for specific fields of the industry, while arguing for both sides. It gives good statistics and show examples via pictures of their arguments (they did this when explaining radiology in the article). The authors that made this article are well known in the healthcare industry with some of the authors working at Cambridge University and another working at the University College London. The source is trustworthy in that it cites and references everything it uses for the article's purpose. Finally, the purpose of this source is to "outline recent breakthroughs in the application of AI in healthcare and discuss the possible future direction of AI augmented healthcare systems". Overall, this is a reliable source for academic work as it suitable for the people wanting to read in more on the topic and is truly trustworthy, having a 15/15 CRAAP test.

[margin note: Reliability evaluated]

A group written essay titled "Challenges and implication of AI in healthcare, an essay" was written by Shiv Kumar Mudgal, Rajat Agarwal, Jitender Chaturvedi, Rakhi Gaur, Nishit Ranjan and published on the 2nd September 2022. (Shiv Kumar Mudgal, 2022) This is a secondary source and is closed access, as it is only accessible via Warwick University. This source is relevant to my research question in that it gives me real world applications that are being used, explaining all of the different types of AI, including Machine Learning, Supervised Learning, Unsupervised Learning, Semi- Supervised learning, Reinforcement learning, Deep learning, NLP (Natural Language Processing) and more. From this research, I learnt more about real life applications, for example Precision medicine and how it can generate personalised plans using large multidimensional data that can capture variability in genes and allow for clinicians to detect diseases or provide prescriptions easier. There is also drug discovery, and how AI can provide "promising" applications including advanced image analysis, prediction of molecular structure, and automatic generation of unique chemical bonds and entities. This source helps me place my research question in the wider context of the research area by talking about everything to do with AI and everything impacting it, and the challenges we face. It goes from defining all the types of AI to talking about Precision medicine to how AI cannot provide reliable answers for clinical applications. This source scores 15/15 using the CRAAP method because it was written in September 2022. The source addresses my question and gives me useful information as it goes through all the different types of AI, gives me backed up and proven information, and provides me with notes which I will be using in the discussion when I will write up this project. The authors are well known and work for the All-India Institute of Medical Sciences and are all certified healthcare experts. The source is trustworthy in that it references and cites everything it uses, as well as giving backed up information such as talking about other applications. For example, they said "NuMedii, a biopharma firm, developed an AIDD technology that can identify rapid connections between drugs, diseases, and systems, if any." Finally, the purpose of this source is to examine the state of AI based technology applications in healthcare and the impact they have on the industry. Overall, this source is a reliable source for academic work as it scored 15/15 in the CRAAP test and is a good source for someone wanting to read up more on the topic, as it includes everything you need to know about.

[margin notes: online essay. wide range AO2 / AO2. relevance to Q. / content ✓. / Link to Question / reliability evaluated]

To address the research, question a survey was designed and conducted by Krishan Patel. (Patel, 2024)The survey was designed in Google Forms to allow the responses to allow easy completion, and compilation of the data. The survey was sent out on the 3rd January, 2024. This is a primary source sent to 8 Healthcare professionals and is a closed access form. This

[margin note: primary research described]

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source is relevant to research question in that it showcases what AI does for them in a specific industry and how they feel it would benefit AI, and the concerns from AI. From this research, I learnt that some fields of healthcare are more attuned to Artificial Intelligence then others, for example how psychology, the study of the mind, cannot be changed by AI, but optometry can be changed as AI systems can detect some eye diseases. This source helps me place my research into the wider context of the research area by widening the view of how we think of AI, and giving me professional opinion, which will be reviewed and used throughout the project. The source scores a 15/15 using the CRAAP method because it is the most up to date primary data collected in January of 2024. The source addresses my question and gives me excellent insight into the current information from different fields in the healthcare industry. The respondents are all qualified healthcare professionals working in different settings which gives me a wide scope on different healthcare fields. The source is trustworthy in that it is a primary source of data where it was collected with specific aims (to identify how healthcare professionals use and think about AI). Finally, the purpose of this source is to further provide information for my project to help me address my research question of Is AI beneficial to Healthcare? Overall, this is a reliable source for my academic work because it scores a 15/15 CRAAP test result, provides information from people who know deeply about the topic as it includes must-know information about AI.

[handwritten annotations: "context summary from his questions AO2.", "reliability of responders", "See also - Appendix 3 and 4 for survey and AO2 also HighMB2 responses provided AO2."]

Discussion

A focus in the healthcare industry with AI tools is saving money. With inflation and the global rising cost of care, healthcare institutions seek to provide services at lower costs, while working 24/7. Research suggests by 2030 there will be 18,000,000 less healthcare professionals and 5,000,000 less doctors for the growing population. (WHO, 2016) Also, in the medical field, AI also can eliminate some repetitive jobs in the workplace, an example being the diabetic screening program in the UK, where diabetic patients are screened once a year by non- qualified optometrists. These people are trained to find diabetic disease, but an optometrist believes AI could take over this screening process and that branch in the industry. (Patel, 2024) Moving on from optometry, in the whole healthcare industry of the US, the wider adoption of AI could lead to 5-10% savings on healthcare spending. (Nikhil Sahni, 2023) On the other hand, while saving money, AI can produce massive job loss and can replace the skills the professional has learnt over the course of their life. Even though AI saves a lot of money in the healthcare industry, eradicating some of the money that healthcare uses on a day-to-day basis would damage the economy, and the goal of job creation instead of job displacement. Professionals are wary that AI will be prevalent in some skills in the industry, with some healthcare professionals in the sector of pharmacy, optometry, nursing/ treatment in online wards saying that AI will one day take over jobs in their sector. (Patel, 2024)

[handwritten annotations: "clear synthesis of researched sources + primary research"]

In the healthcare industry, treating patients quickly and effectively is key. Usually, there are loads of people seeking healthcare support and humans cannot work 24/7 to tend for their needs all of the time. However, AI can work like humans cannot, without any sense of tire and can do anything for as long as you want it to. AI, although not as sophisticated as humans, can help with making the process easier. It can help record data that a patient may give, removing another step a clinician has to do, thereby reducing their load of stress. These technologies also have the capability to double check findings and make sure everything the healthcare professional has done it right.

Although AI is sophisticated, unstoppable forces drive healthcare demand: Changing patient expectations, population age, lifestyle shifts, innovation. (Shiv Kumar Mudgal, 2022) AI will need to be kept updated for anything to work. With these unstoppable forces come complicated healthcare situations, because AI is not trained for every complicated healthcare situation, but just the data it has been given, whereas healthcare experts have practical experience and have more knowledge on irregular situations and what to do. AI can only know so much before healthcare changes drastically and every AI augmented system in the world will have to be updated. This will create instability if AI is heavily relied upon in the future as people need healthcare instantaneously for everything.

Clinicians and healthcare professionals are constantly checking patients and doing work, and they usually have no one else to help them (another clinician to check up on their findings). Well, for some healthcare professionals I surveyed, they see AI purely as an educational tool or a way to double check findings, which shows that they feel that AI is sophisticated enough to teach others on a subject in healthcare and is good enough to check the data a healthcare professional has given for it to give back accurate answers. An example of this could be the potential application of InnerEye deep learning toolkit which helps clinicians by monitoring tumour progressions, planning for surgery, which could make their lives easier by removing all the other things they have to do, focusing on the main problem- the patient's health. (Ozan Oktay, 2020) An example of AI being an educational tool in healthcare would be the Noom app, which is an educational AI tool focusing on teaching others how to improve their psychological and physical health on the end goal to achieving weight loss. Being overweight is the single biggest risk factor for a number of health conditions including diabetes, cardiovascular disease, heart conditions, and more.

Even though these AI applications that help tremendously exist, healthcare institutions and healthcare professionals need to be trained to use this software. AI costs a lot, and the mass installation of this software would be hard (with the implementation of AI ranging from $20000 to $1,000,000 (Anon., 2024) meaning that national healthcare services will have to spend money in order to install AI, a technology that the healthcare industry is split about, with some healthcare professionals having concerns about how all professionals will have to be trained in the industry, and how it will take a long time to do this.

The most important part of healthcare is diagnosing and treating diseases, which is why it is what most healthcare professionals do as most of their job revolves around patient care and making sure they get better. AI could be vital in this process of treating and diagnosing disease. AI can treat diseases, with some online apps. Another virtual app called Onduo helps manage diabetes. They do this by monitoring glucose levels, and intake of food within the body. AI can diagnose some conditions as well as treating it, with an AI augmented system developed in collaboration with Scripps Research and Intel was able to diagnose patients with cardiovascular disease, with an 85% accuracy rate. (Blog, 2021) This shows that AI made to help cardiology works for the most part and is doing what healthcare professionals can do- detect disease. AI has the potential to help diagnose and treat patients. A research study published by IEEE used AI to diagnose liver disease hepatitis and got 97.5% accuracy. (S. Ansari, 2011) This experiment was conducted in 2011 which shows that the development of AI in its early stages proved to be highly accurate.

In an ideal world, patients would go to their healthcare professionals wanting to be treated. As time moves on, AI is becoming increasingly suited to the healthcare environment, but is it to the patients? Having that personal touch in healthcare could improve the condition of a patient and removing this could have a negative impact in the future. (Vanderknyff, 2023) It is vital we understand what patients might feel, because most people have been used to human healthcare ever since the birth of organisations like the NHS in the 1940's. Many Companies who make AI for healthcare have declared themselves "Technology" companies even though healthcare is supposed to be a human-oriented industry. This shows that they think of the industry as fundamentally swayed by AI, overwriting healthcare providers.

In clinical practice, or anywhere in the healthcare industry, sourcing and finding data out is key. Healthcare professionals rely solely on each other to source, find and analyse data of all sorts to help people who may need to access or use this information in the future. AI is good at sourcing data as when it is programmed it is taught to check for absolutely everything. AI will always be able to analyse and provide up to date information faster than humans- as they are taught to identify patterns and trends that will take more time for humans to do. This leads to data sourced with a general formula/ pattern to go by, so it is easier. In a healthcare environment such as psychology, a psychologist said that it could be used in the background for data collection, to then be reconciled by a human (Patel, 2024). This shows that clinician to patient confrontation should be used so they can further look into what they need to do to help the patient, rather than adding notes of the patients' needs being another thing they have to do.

On the other hand, there are concerns over the accuracy and consistency of AI. Clinicians, with all the training they have had in their area of expertise, will be able to accurately identify wrongdoings, while AI does not. AI can collect data, but we do not know the quality of that data until a clinician has personally checked that (Patel, 2024). This shows that healthcare professionals question AI and the way it works. The accuracy of AI always has downsides. Artificial Intelligence fails to consider social variables, which could drastically sway their condition. These systems will not know how to interpret emotion and how the patient is feeling. Another factor swaying the accuracy of AI is its ethics. Racial diversity and inclusion are one of AI's ethical concerns, as it can provide unfair or harmful outcomes to certain ethnic groups. AI is made up of algorithms- the neural network, as we know it today- which developers can change on their own accord. (Pazzanese, 2020) They can be making changes that could be impartial. For example, there can be gender-imbalanced data for detecting chronic pain. This shows that AI's neural networks may not be trustworthy, and how developers have a dangerous amount of power in their hands.

Conclusion

In answer to the question Is AI beneficial to healthcare? My conclusion is that AI is beneficial to healthcare. It is an advanced form of treatment and methodology for healthcare, as it is a tool that has many uses for the healthcare industry. From being able to diagnose tumours to dispensing medicine, I believe AI is a very good tool for healthcare professionals to use as a helping aid, as right now it specialises in repetitive jobs. However, I do not think that AI would be able to take doctor's jobs due to the many flaws it has, one of them being ethical issues. However, I do think, as time goes by, more solutions to the problems AI has will be made. In 5-10 years, I believe AI will be sophisticated enough to take on simple jobs in the healthcare

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industry, but patients may not be accepting of the thought of AI in their healthcare experience.

This Project could be extended by conducting further research into the neural system and how AI is programmed, that way you would be able to see design flaws in the process of making AI-augmented machines and be able to fully explain why AI is able to do certain things. The project could also extend further research into AI and it's application within surgeries. If AI has potential to work in this area of healthcare, it's skills can replace that of surgeons. Further research into technology companies that make AI will ensure that they are making safe machines, rather than judging on statistics it produces. Understanding the value of AI in healthcare is something that has never been certain, so analysing growth in the industry would answer for it's use in the industry.

Evaluation

Whilst undertaking this Project, I have learnt a great deal about the healthcare industry and the healthcare environment paired with AI. I also believe I learnt a lot about medicine itself while researching AI, including information about various tumours and disease.

My original aims and objectives, as set out in Section 1 of my Project Proposal Form, were to find out if there were complications that came with AI being involved with healthcare. I also mentioned that I wanted to know if AI could analyse data. I believe that I have achieved these aims in that I have written about these topics in the dissertation, which were provided from sources I researched.

I have learnt a great deal about the research process, during this time I have become much better at time management and fixing my own problems that have occurred during a project. I also enjoyed taking full responsibility of a project from start to finish. This means I have experienced everything from planning all the way to final writeup. I also learned a lot from the writing process including how to use functions of word such as referencing, creating a bibliography and contents table. I also learnt how to conduct a survey using Google Forms and use all the information collected to help me with writing paragraphs fitting my arguments.

As with every project, there were some limitations to my methodology which included the survey was people's personal experience with AI in Healthcare and what they thought about it, so it may not be accurate. AI is still a developing topic which is why not many accurate answers exist. We had a small sample size of eight people therefore this may not represent a range of opinions from healthcare providers.

With hindsight, I should have cited everything I needed to while I was writing up, as it is very tricky to go back to all of the sources again. I also think I could have managed my Project Plan and Log better, rather than doing it five minutes before the lesson ended, I should have taken a bit more time rather than just going all out into the dissertation when I needed to. I also think I should have tried to monitor my progress against the time plans, as that would teach me where I needed to be. Finally, managing where my report was stored and organisation was vital, as I nearly lost most of my dissertation due to not saving it correctly.

I have learnt skills from this project, namely independence, developing ideas for a topic and research skills which will help me in the future because I will need to be equipped with these skills if I am to undertake EPQ Level 2. Generally, in life, you will need skills such as independence as there is not always someone there to help you. This project has also taught me how to look for information and critically evaluate it for my research, which will help me whenever I have to produce a piece of writing that needs to be factually correct.

[handwritten annotation: future skills AO4.]

[handwritten annotation: A thoughtful & developed evaluation AO4 MB2.]

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[handwritten annotation: AO2 Good range of sources for research. Clear and well organised bibliography.]

Is AI Beneficial to Healthcare?

The following set of questions are for healthcare professionals to establish their thoughts on AI in healthcare. There are no right or wrong answers. This data will be used for my FPQ (Foundation Project Qualification) for which I will produce a overall report discussing this topic area.

By filling out this form you consent to your data being used for my project. Your identity will remain anonymous. Any quotes used will also be anonymised and will only be referenced to your profession, gender and age.

Thank you for your time in helping with my project.

* Indicates required question

1. Gender *

    Mark only one oval.

    ◯ Female

    ◯ Male

    ◯ Prefer not to say

    ◯ Other: _____

2. What is your age? Please state below.

    _____

3. What is your occupation? Please state below *

    _____

4. Where do you work the majority of your time? *

   Mark only one oval.

   ○ NHS

   ○ Private sector

   ○ Academia

   ○ Other: _____

5. Are you aware of AI being used in your profession? *

   Mark only one oval.

   ○ Yes

   ○ No

   ○ Unsure

6. What do you think are the advantages of AI being used in your profession? *
   Why?

   _____

   _____

   _____

   _____

   _____

7. What do you see as the challenges of AI in your profession? Why? *

   _____

   _____

   _____

   _____

   _____

8. In your opinion, how do you think AI will affect patient care? *

9. Do you think one day AI will take over some jobs in your field? Why? *

10. How would you be able to work with AI to improve efficiency in your field? *

Google Forms

Appendix 4 – Collated Answers From Survey

Is AI Beneficial to Healthcare?
8 responses

Publish analytics

Gender   📋 Copy

8 responses

- Female
- Male
- Prefer not to say

75%   25%
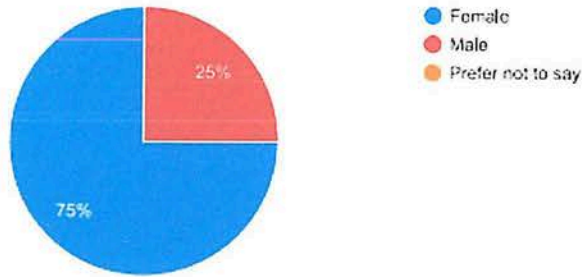
What is your age? Please state below.

7 responses

31

47

38

32

64
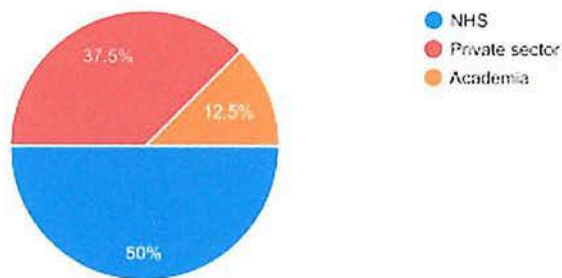
43

29

What is your occupation? Please state below
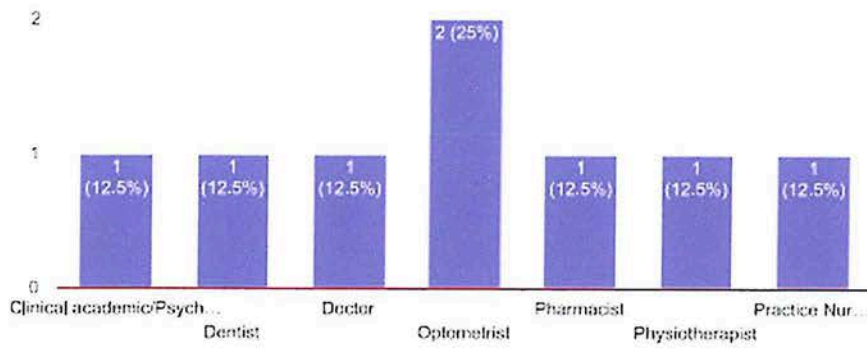
8 responses

| Clinical academic/Psych... | Dentist | Doctor | Optometrist | Pharmacist | Physiotherapist | Practice Nur... |
| 1 (12.5%) | 1 (12.5%) | 1 (12.5%) | 2 (25%) | 1 (12.5%) | 1 (12.5%) | 1 (12.5%) |

Where do you work the majority of your time?

8 responses

- NHS — 50%
- Private sector — 37.5%
- Academia — 12.5%

Are you aware of AI being used in your profession?

8 responses

- Yes — 75%
- No — 25%
- Unsure

26
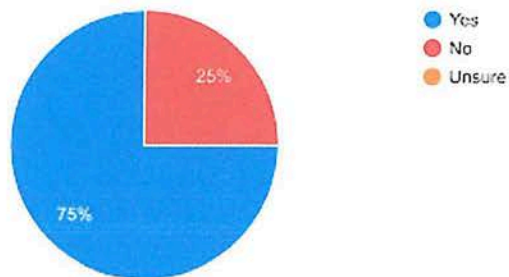
What do you think are the advantages of AI being used in your profession? Why?

8 responses

Cost saving, time saving, removes repetitive workload and tedious roles in the profession

Quick assessments, helps with non communicative patients , way to double check findings

For certain things perhaps

Excluding normal studies

Reduce errors with manual input of data

It can provide up to date information quickly and can save time for health professionals. It can potentially enhance patient care and can serve as an educational tool. It can help with recording of data to save time for clinicians and thereby reduce their load and stress. It can help with diagnosis of conditions.

AI in clinical practice could make information and interventions more accessible. Could be used for assessment/screening and data collection. Also perhaps in aiding note taking and even plan formulation but with the combination of human interpretation. Could it also be used more entirely to draw together patient data and records as a summary report for clinicancs for up to date information? Also AI for remote therapy, an efficency for live communication with access to tools and online information for instant use and monitoring.

I believe in future AI may be able to help with the screening of certain eye diseases in future without compromising patient care. Currently in the UK there is a national diabetic screening program in which diabetic patients are screened once a year. During this screening photographs are taken of the back of their eye and they are then analysed by staff that are not actually qualified optometrists. These staff workers are trained in order to identify the signs of diabetic eye disease and to then refer onwards via the appropriate pathway for further management. If AI can become sophisticated enough it may be able to take over this screening role by being able to identify these diabetic changes in the eye and managing them accordingly.

What do you see as the challenges of AI in your profession? Why?

8 responses

AI cannot always answer or deal with medication discrepancy issues or individual issues which arise in practice. AI may only identify specific errors not all dosage errors

Replacing skills of what the professional has learnt

Efficiancy

None. It will be helpful

Not widely accepted, seen as a threat

AI can efficiently retrieve information, but the clinician may not know the source or quality of that information. Also, AI cannot critically appraise the information the way a clinician can. It is important to consider how the patients feel about AI being involved in their experience. Very important is confidentiality which may be compromised when using AI.

One major concern is diversity and inclusion which has been raised widely already amongst healthcare professionals. The other is training of clinicians to ensure they are able to effectively and efficiently use such tools in the future.

AI within healthcare is seen with cautious optimism. I believe that it's use can greatly enhance the patient experience and care whilst also slashing the wait times for many sectors of healthcare. My concern with AI within ophthalmology and optics would be it's accuracy and consistency in being able to correctly detect certain eye diseases. At this point in time I don't believe that it is sophisticated enough however with the advancement of technology I wouldn't be surprised if within the next 5-10 years we see it being implemented on a trial basis. I believe it would find initial success in triaging of patient symptoms and shepherding patients to the appropriate healthcare professional rather than being used for disease detection straight away.

Do you think one day AI will take over some jobs in your field? Why?

8 responses

Yes. With medication dispensing robot technology has already been installed and is in use.

No, still need to have some tests done manually and analysed by a human

Yes AI will be used just not sure where

No. Clinicians including surgeons would always want to go through scans and patients with us to make sure they are operating appropriately and safely.

Yes - appointment booking and role of receptionist can become redundant

AI is already being used in the profession. I think it is helpful for data recording and for learning and researching and finding information.

No, because in Psychology the element of human interpretation, empathy and emotional intellegnce is essential. I see it more as a collaborative approach.

Definitely. Just how self check out and contactless payment has somewhat began to replace kiosk workers I think that eventually AI may replace those currently working in roles such as triaging and screening. These roles are currently being done by those with only some or sometimes no clinical knowledge/qualifications. If AI can be improved so that it can ask the appropriate questions for any given symptom it has potential to even offer differential diagnosis for the clinician a patient will be referred to. Having this information to begin with would greatly improve the speed at which patients are seen through the current NHS system, saving the NHS both time and money.

In your opinion, how do you think AI will affect patient care?

8 responses

It will help improve care in some aspects i.e. 24 hours service and reduce human error but affect patient care in other aspects i.e. limited resources and access to human advice and only computer generated advice

Loose personal touch

More efficiant less one to one consultaions

Positively, however in my field as a radiologist I am not sure whether surgeons or clinicians would rely on machine learning on complex cases.

Generally positive

I think it may help to streamline appointments and perhaps give added time for patient-clinician interaction (if AI is used to record notes during consultations). It may help to get patients the most appropriate treatment more quickly through quicker diagnosis.

I feel it could benefit patient care by allowing access to data, formulation and access to information and tools in an efficient time allowing more time for quality care.

As written above I believe it has the potential to help many patients get seen quicker if it can be implemented into triaging. This can help with waiting times at hospitals and relieve pressure from hospital and GP admin teams. If sophisticated enough it would be amazing to see it help with disease screening. This would help reduce staff costs and waiting times for patients. Both the above points in triaging and disease screening would help save on staff costs and allow money to be spent elsewhere within the NHS where it may be used for more clinical use, eg treatment/medication

How would you be able to work with AI to improve efficiency in your field?

8 responses

Pre-populate known errors and ensure there are robust measures in place to overcome these errors i.e. pack size dispensing errors or drug dosage errors when dispensing different pack sizes

Use it as a way to show patients results so they can visualise what we are trying to explain

Maybe with Blood test interpritations education and prevention of chronic Disease

Exclude normal studies, leaving the complex studies to humans to report

To make certain procedures easier for patients and it could play a role in managing anxiety

I think recording of patient-clinician interaction by AI could improve efficiency. It may also help clinicians to generate rehabilitation/exercise protocols and thereby save time.

I would want to learn more about the use of access and formulation of data as well as some more efficient use of intervention delivery using AI. This could be groupnor one to one sessions.

If AI began being incorporated into the diabetic retinal screening program so that it can learn from the responses of those workers who are currently performing the screening for patients it may eventually be able to screen patients independently after it has taken in enough information. AI may also be able to help with triaging patients symptoms before booking in to see optometrists for enhanced health checks. AI would need to be able to intake the information current triaging staff use to screen patients with in order to learn how to properly assess and advice patients on what to do. I believe that in time AI will be able to do this and also give differential diagnosis' to the clinician before they've even seen the patient. This would greatly speed up appointment times and wait times for both optical practices on the high street and ophthalmology/eye casualty departments in hospitals.