AI in Medicine: Breaking the Line Between PC and Patient

Jacob Smith

Project Objective:

AI is a growing force in the world, and as it grows you can either grow with it or fall behind. I propose the healthcare industry starts to grow with it. In this study I plan on testing the effectiveness of AI in healthcare using ChatGPT-4 to give diagnostics and treatment. In doing so, I plan on displaying AI's effectiveness in speeding up healthcare; proving its effectiveness, and need for implementation in the field. If an AI bot like ChatGPT could successfully be deployed in hospitals and other clinics, lots of time and lives could be saved.

Background:

It's no surprise to anybody that healthcare is a mess. It's even messier if you're a worker in healthcare. There are long hours, horrible sights, and it requires many years of schooling to even get in. Not to mention extreme demand with not enough workers to match. What's even worse? Around a quarter of the nurses in the workforce currently plan to leave by 2027, and 47% say they are overloaded with work. I think it's time to give these nurses a break, and I propose using AI to handle this task. I believe implementing AI into this hectic workforce would give some much needed help to those working to keep our nation healthy. By implementing AI into the healthcare profession and hospitals across the nation I believe these issues would be greatly reduced. Having something as simple as a chatbot like ChatGPT to diagnose patients could help doctors and nurses alike. It would reduce patient turn around allowing more people to be seen, diagnosed, and cured in a day. Not to mention the huge weight this would take off the nurse's backs. It also helps a lot with the shortage of workers, allowing for more efficient work to be done so less workers are needed. Lastly, it would allow nurses to have more time off and maybe encourage them to stay and have a healthier work life balance. So why isn't it more commonplace?

It has been shown many people, even doctors, don't trust AI for surgeries as it relies on unpredictable, and unexplainable calculations. These robots also would need clinical trials and have to undergo a lot of testing. That makes sense, but a small AI chatbot for diagnosis and prescriptions, however; that would require little testing and poses very little risk to patients. Not to mention there has already been research showing this is an effective method. In patients with mental illness it has been shown that AI chatbots were useful in managing symptoms including but not limited to stress, anxiety, and depression. It has also been shown that AI, specifically ChatGPT, is useful in educating patients and helping people discover healthcare alternatives. For these

reasons, I believe testing and implementing AI in healthcare is crucial. It would have countless benefits.

Research Methods:

The first step of our research process will be finding a group of applicants to survey. These subjects will be a random sample size of UCF students who come into the Student Health Services here at UCF. According to research, a sample size of 1% should be efficient. So, given our student population of sixty-eight thousand students I propose surveying a minimum of 680 students. The students that make up this sample size should have a variety of 10 or more different illnesses. This will ensure we test ChatGPT in a multitude of ways that will give my team a better understanding of ChatGPT's capabilities when diagnosing, and dealing with different illnesses and symptoms. When they come in we will ask them if they want to participate in the study. Those who say yes will be surveyed. The patients who agreed will be taken into a separate room. In this room we will have an Ipad with ChatGPT set up. For this step, I would like to reach out to OpenAI and get their approval and collaboration on this. This would allow the students personal info to be input into ChatGPT while still being protected from public use. From there, the Ipad with ChatGPT will be given the prompt, "given the following information, diagnose the patient" From there we will have the patient carry out a conversation with ChatGPT answering back and forth as needed. At the end of this chat we will ask ChatGPT to give the patient a diagnosis as well as recommended treatment.

From there the next step of our research will be having a doctor review the results. Following the diagnosis from ChatGPT our patient will finish their doctor's appointment like usual. Once they're finished we can review with the doctor to see if their methods and what ChatGPT recommended line up. If they do not we will ask the doctor to tell ChatGPT why and where it was wrong and continue from there. If the doctor's and ChatGPT's results are the same we will continue to the next applicant. After each applicant is finished we will also take them through a final evaluation to see how their experience was using ChatGPT, how they liked it compared to talking to a doctor, and how it could be improved. This process will continue until we have a sufficient sample size of students and different illnesses that have been tested. Once we have all these results which shouldn't take longer than a couple weeks; we can begin analyzing the outcomes. If our patients didn't have a high success rate with diagnostics or didn't enjoy the ChatGPT experience, the evidence would suggest AI is not in a place where it's ready to be compatible in healthcare. But, if ChatGPT can successfully diagnose symptoms at a faster rate than doctors while maintaining a good experience with the patient, the potential would be huge.

Expected Outcome:

Upon the completion of this study, I plan on publishing a report that displays the accuracy of ChatGPT compared to traditional medical evaluations. I plan on sharing these findings through a scholarly article. As well as making a presentation for the undergraduate press conference. This report and presentation will focus on my findings and what they mean for the implementation of AI in medicine moving forward.

The biggest piece of information I'm looking for from this study is seeing how ChatGPT's results compare to the traditional medical evaluation. I'm also curious to see how the patient's experience was in turn with this. These results could change the future of medicine. If both of these display a positive result it would be groundbreaking for the future of AI in medicine. A positive result would indicate that AI was successful in improving the patients experience, and at reducing work for the doctor. This would provide a very solid argument for implementing more AI in the workforce and could lay the groundwork for a lot of invitations. While I don't think AI would or should replace healthcare workers, the amount of workload that could be taken off nurses back's would be huge, not to mention the many lives that would benefit from it. If the results do not suggest a positive impact from the AI, that is just as valuable. It would help show that AI is not ready to be widely implemented into healthcare and still needs some work. Researchers could also look into this for key takeaways to improve AI and get it more prepared to be implemented successfully into the workforce. Regardless, for the UCF community this would also be great. It demonstrates how new technologies like AI can be used to change the world, and would show our innovation as a school; backing these new technologies.

Works Cited:

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Preliminary Work and Experience:

I am a Computer Science major here at UCF and as such I have a lot of experience working with computers and code. I have also worked with AI in some of my projects while working on games. I believe this will give me a better understanding when working with ChatGPT to get the desired results. On top of this, I have a very large family with many doctors. This has granted me a lot of first hand insight into the field, and I’ve seen first hand just how overworked and stressed these people are. One of my aunts, for example, she’s a nurse and has five boys at home. While balancing this hectic homelife she’s working overnights and incredibly long, mentally draining shifts. I can only imagine how implementing a service like this could help make her day to day on the job that much easier. The last thing I’d like to mention is, I have conducted multiple experiments before in science classes and I have information from my statistics class on calculating and conducting fair surveys. For these reasons I am confident I will get accurate and fair results that will suggest AI’s potential impacts in medicine.

IRB/IACUC statement:

As I plan on interviewing and surveying human subjects, especially with this kind of information; I will need extensive approval from the IRB.

Budget:

My approximate cost of this study will be $0 as long as I am approved to talk to the doctors at the health center and use some of their time. I have the rest of the required materials already.