People’s Perceptions of AI Utilization in the Context of COVID-19

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Abstract. Taking into consideration the scarcity of interview-based research in Artificial Intelligence (AI) literature, we conducted 15 semi-structured interviews regarding our participants’ experiences with AI, where we observed a number of notable themes. In this paper, we focused on participants’ thoughts and opinions of AI use during the novel coronavirus (COVID-19) pandemic, a global crisis. Although there have been studies relating AI to COVID-19, there is insufficient in-depth understanding concerning the way people feel about AI utilization in the context of COVID-19. While there was mostly positive feedback that AI could help in the COVID-19 calamity, such as COVID-19 testing and monitoring vital signs, two out of 15 participants expressed doubt that AI could be successfully implemented in healthcare, and four out of 15 participants mentioned potential issues with this AI application. We are among the first researchers exploring people’s opinions on AI usage in the context of COVID-19, so this paper provides a foundation for future work.

Keywords: Artificial Intelligence · Coronavirus · Public perception

1 Introduction

The novel coronavirus, also called COVID-19, is a severe respiratory disease first identified in Wuhan, China, in late 2019 [17]. According to the World Health Organization, as of October 19, 2020, there have been 39,944,882 confirmed cases of COVID-19 and 1,111,998 deaths caused by this disease globally [16]. In the United States, there have been 8,128,524 total cases of COVID-19 and 218,986 total deaths [5]. More than four-in-ten Americans admit that the pandemic has greatly changed and impacted their lives [14]. Fortunately, Artificial Intelligence (AI) guarantees a new model for healthcare [15], and AI used for healthcare offers an upper hand compared to clinical techniques [6]. Some examples of AI usage in the context of COVID-19 include FluSense, a device that utilizes AI to forecast patterns in infectious respiratory illnesses [1], a deep learning model developed to distinguish COVID-19 from chest computerized tomography images from community-acquired pneumonia [12], and an AI tool that estimates the survival rates for COVID-19 patients [18]. COVID-19 outbreaks and their global nature of spread can be identified through AI-driven tools [15]. Even though AI-driven tools are still
in their infancy stages, and slow progress is being made in their adoption for serious consideration at international and national policy levels, AI-driven algorithms are gaining accuracy [2]. By way of illustration, companies such as Metabiota and BlueDot predicted the COVID-19 crisis in China through AI modeling before it caught the world by surprise in late 2019 by both scouting its spread and impact through utilizing a survey of prior viral outbreaks over the last 20 years [2].

AI utilization has proliferated across industries due to advancements in algorithms, usage of massive data sets, and ever-increasing computational power and storage at a low cost [7]. The popularity and relevance of AI use, especially in today’s new world of COVID-19, will compel researchers to explore its socio-technical implications in human-facing applications [3]. Still, how people perceive AI utilization in the context of this pandemic is unknown. With the advancement of AI, individuals and industries will be dramatically affected. More profoundly understanding people’s experiences and thoughts about AI will help define priorities for policymakers and technology designers.

AI can be employed for various healthcare applications, such as stroke detection and diagnosis [11]. Citizens of the UK are optimistic that new technologies will create efficiencies in the health system, increase successful diagnoses, and give doctors more time with their patients [4]. AI’s ability to analyze large amounts of data makes it an ideal tool for preventative public health measures if the population consents to the data gathering and data usage [4].

Much of the current research on people’s experiences with AI is survey-based. Therefore, in this paper, we provide data concerning participants’ experiences with AI from 15 semi-structured interviews. We chose to focus on people’s thoughts and opinions regarding the implementation of AI in the context of COVID-19. Due to the novelty of COVID-19, we are among the first researchers studying people’s opinions on AI usage during the pandemic, so this study provides the framework for subsequent research.

### 2 Methods

We chose an interview method to better grasp how individuals’ life experiences and perceptions of technology shape their understanding of AI. Due to COVID-19 constraints, we recruited participants via convenience sampling from a variety of social media platforms such as Facebook, Instagram, Nextdoor, and Reddit.

A total of 15 participants (see participants’ demographic information listed in Table 1) discussed their opinions and experiences concerning AI in semi-structured interviews ranging from 22 to 75 min. For 13 participants, audio was recorded from video or audio calls and then transcribed by Otter.ai [13]. Afterward, we edited the transcripts. Interviews were manually written for two participants who refrained from audio recording.

Concerning the interviews, firstly, we wanted to know what our participants thought about AI in general and what they thought AI actually means, so we asked them about words that they associate with AI and what experiences they have had with AI. Moreover, we asked them if they had conversations about AI with friends or family. Then, we read them a definition of AI, namely that it is “a term applied to a machine or software mimics cognitive functions that the humans associate with the human mind functions such as learning and problem solving” [9]. Afterward, we asked our participants if the definition
 seemed in line with their understanding of AI. Next, we asked if our participants have general concerns about AI and the last time they heard or talked about it. Furthermore, we discussed their first memories of AI, the AI technologies they are currently employing, and privacy concerns they have about it. We also asked our participants to describe future uses for AI related to COVID-19 and how they can see AI helping with the pandemic. Lastly, we asked our participants questions related to AI regulations, policies, and designs.
By applying an inductive thematic analysis [10], we inductively coded the interview transcripts separately and then compared our individual coding systems, which were well-aligned. Given the timeline of the project and the amount of data to be processed, we individually analyzed specific themes, modifying codes for individual analyses, where required. While coding, we utilized intercoder agreement checks to ensure code alignment [10]. We had conversations about our codes, we read each other’s codes, and we came to a shared agreement on all of the codes.

3 Results

Participants were asked how they think utilizing AI would affect COVID-19, and there were mixed results. While all 15 participants had an idea for how AI would help ameliorate the spread of the virus, five participants had negative thoughts and opinions regarding its use in healthcare.

3.1 Positive Thoughts and Opinions

Regarding optimistic opinions of AI usage in the context of COVID-19, there were six participants (P3, P4, P5, P6, P10, P12) who suggested that AI could potentially be applied to COVID-19 testing, and two participants directly commented how AI can be beneficial for COVID-19 testing. Concerning AI being employed to help with COVID-19 testing, P6 stated, “It would be beneficial I’m sure if these things can figure it out, even give a test for that or something.” P3 pointed out that AI conducting COVID-19 tests will reduce human-to-human contact by explaining, “They can somehow do the tests without needing to actually be there and like for very long without having to expose another human to the virus.”

Five participants (P2, P4, P5, P7, P12) indicated the possible use of AI to monitor vital signs, and two of these participants noted how intelligent machines can reduce contact between hospital employees and patients. P2 remarked, “The machines that would take the, you know, the vital signs and all that going into the room without having the nurse interact with the patient, like doing the vital signs with them checking the temperature.” According to P4, “If we all had our own personal computers, like a machine like the Jetsons have, maybe the machine can take our temperature and monitor our vital signs… If an AI could be programmed to do the testing then that can be given instant results instead of having to wait weeks and days to get results.” P5 asserted, “I see it as a substitution or a replacement to telemedicine or telehealth, which could be helpful to take initial vital signs… AI can replace telemedicine and telehealth in very basic ways like overall physicals.”

Three participants (P1, P9, P13) pointed out how AI-based location tracking can stop the spread of the virus. P1 mentioned phone-tracking to see when people are traveling or going outside, and she said, “Maybe, is it, like, they track your phone and see, like, if you’re outside? Maybe, if you’re, like, in a car or something, and they’re not headed to the grocery store or gas station, then you get punished or something.” P13 stated, “Think about just how many packages Amazon is still delivering day-to-day at this point and then even just going from where that package started to even just a zip code that it’s
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going to that can end up affecting potential spread things like that... Probably tollways would be a big information hub there because then you can see where one license plate is moving from place to place with that. So, you can see if someone is moving across the country.” While these three participants mentioned how AI can be used for location tracking, none of them had ethical concerns with this potential function of AI, as they were all supporters of it. They believe this function could be beneficial.

Four participants (P2, P4, P8, P10) noted how AI is efficient. They also stated how AI’s efficacy can help in healthcare, especially in battling COVID-19. Furthermore, P2 explained how AI can help abate the COVID-19 pandemic by removing human-to-human contact. She stressed, “We are set that we’re not putting, you know, the healthcare workers at risk, or we’re kind of ending this faster because we were eliminating that human-to-human contact.” P8 expressed how AI can accelerate clinical trials for the virus by suggesting, “It seems just a lot more time-efficient to put that process through like an IBM Watson and help us come up with something that could maybe get us to a clinical trial faster.” P4 noted how AI has the potential to clean hospital rooms quickly by stating, “AI can be cleaning up after the room so patients can get in and out of the rooms quicker.”

3.2 Negative Thoughts and Opinions

Concerning the negative comments we received about AI being applied to help mitigate COVID-19, four participants (P5, P7, P10, P14) mentioned potential AI healthcare issues, such as inaccuracies, complications, and errors. Two participants identified potential complications with AI in healthcare adjusting to different patients’ conditions. P5 remarked, “I could see some issues with that, just based off the fact that I’m not sure how AI can adjust to patients who are overweight, who have different kinds of conditions that cause them to have a certain heart rate that can change five minutes or so depending on the medications that they’re taking.” According to P7, “Say you had something just as generic as a temperature sensor to check everybody’s temperature. How are you going to take a low-grade fever when there’s all that fluctuation (you know, people’s temperature and baseline temperatures and such)?” Two participants directly pointed out potential, fatal AI consequences. For instance, P10 warned, “In some cases, if that AI were to make a mistake, that can be fatal.” P14 explained, “You can tell when somebody’s sick, obviously not give them a diagnosis on the spot, and prescribe them the exact medications they need, because obviously it will, like, make mistakes and it’d be better to have it more thoroughly checked over as a first-line like a first response.”

Two participants expressed doubt about AI use in healthcare, especially in the context of COVID-19. When discussing the COVID-19 pandemic and AI uses in healthcare, P6 suggested, “It would be beneficial, I’m sure, if these things can figure it out, even give a test for that or something, but I don’t think those things would ever work,” since she thinks these applications are currently unrealistic. P10 offered similar rationale for his hesitancy regarding AI utilization in healthcare and specifically for combating COVID-19 by claiming, “AI can test different scenarios and different situations with medications and whatnot through algorithms to be able to determine a vaccine. Of course, this is probably something that’s a bit far-fetched.”
4 Discussion

Four participants asserted how AI application in healthcare would have issues, complications, and inaccuracies regarding COVID-19. However, the literature states that the precision of AI-driven algorithms is increasing [2], and as AI is becoming more advanced and sophisticated, it can rapidly solve complex problems, such as those related to COVID-19 [6]. Thus, although AI is gaining accuracy, four participants do not believe that AI is improving, as they think it will cause issues and complications.

Five participants had doubtful feelings regarding AI in healthcare related to COVID-19 or felt that AI would cause healthcare issues and mistakes. Two of these participants expressed doubt regarding AI being implemented in healthcare; they are not fully optimistic that AI can be successfully employed in healthcare. Also, four of these five participants claimed that AI in healthcare would encounter issues, complications, and inaccuracies. These participants are also not entirely confident about AI in healthcare. However, in a UK study conducted in 2018, citizens stated that they are optimistic that new technologies in healthcare will create greater healthcare efficiencies, increase successful diagnoses, and give doctors more time with their patients [4]. Therefore, our study contrasts the current literature, as five of our 15 participants are not fully optimistic about AI in healthcare due to the fact that it is a new technology.

Although five participants were wary about AI applications in healthcare as it relates to COVID-19, none of our 15 participants directly opposed its usage. All of our participants either strongly or somewhat supported AI development in healthcare, even if they felt suspicious of it. This does not align with previous research that demonstrates the mixed public perception of AI [8, 19]. A 2020 study showcased that when talking about medical AI on social media, almost 40% of public posts were neutral or were against it [8]. Furthermore, a study conducted in 2019 describes that when given a short explanation of the development of AI, 41% of Americans somewhat support or strongly support the development of AI, and 22% of Americans somewhat or strongly oppose it [19]. When thinking about AI, all 15 study participants are open to the application of AI in healthcare, but they agreed that there should be regulations to manage it. Concerning regulations, these results are similar to the same study conducted in 2019 that states that 82% of Americans believe that AI should be carefully managed [19].

5 Limitations and Future Work

Due to COVID-19 constraints, we used a convenience sampling method to recruit participants. Therefore, our participant sample was not as diversified as the general population. Prospectively, we recommend recruiting a more highly diverse demographic participant sample. Furthermore, we did not ask our participants what their technology adoption behaviors were or if they were previously interested in AI. Thus, we recommend asking participants this information to understand which participants have more accurate expectations of what AI can and cannot do in the healthcare industry.

Our findings suggest the following future research to explore: How can people support AI while not feeling optimistic about its utilization in healthcare? Also, if AI is implemented to help combat the COVID-19 pandemic, will people’s perceptions about
AI in healthcare improve so that they will be open to the recommended treatment, device, or medicine?

6 Conclusion

Our results demonstrate that, although all 15 participants theorized how AI would help assuage the spread of COVID-19, five participants expressed hesitancy regarding its use in healthcare. These findings are far-reaching because having doubts about AI could negate people’s willingness to seek healthcare treatment in the future if AI is adopted. If there are doubts regarding the accuracy and efficacy of AI, people might not comply with their physician’s recommended healthcare treatment, devices, and even medicine. Based on the foregoing analyses, our results offer a mix of perceptions of how AI can be useful in healthcare. This is germane because public adoption and public support of AI applications in healthcare could be mixed, as some people may strongly support AI, while others may be skeptical of it. Moreover, most people are open to AI usage in healthcare as long as there are regulations to manage it. As a result, AI usage in healthcare, in general, and COVID-19, in particular, may ultimately impact public policy.

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