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Sushrut Lamsal

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Attitudes Towards AI in Healthcare Among High School Students and Healthcare Professionals in Toronto

Sushrut Lamsal

Abstract: Discussions about artificial intelligence (AI) in healthcare are becoming increasingly prevalent, given the growing influence and developments of AI. Furthermore, the scale of AI's influence renders it important to understand the views of both younger and older generations, as they represent the future and current attitudes of recipients and leaders of healthcare. This study explores the attitudes towards AI in healthcare among high school students – an underrepresented demographic in the literature – and healthcare professionals in Toronto, Ontario. Using an explanatory sequential mixed-methods approach, a survey was conducted using a 5-point Likert scale to assess participants' (n = 68) overall views and establish broad trends across four domains: confidence, concerns, ethical and regulatory concerns, and practical applications. Optional, structured interviews were then conducted with willing participants (n = 15) to provide context to survey responses. This study benefits policymakers and governments in ensuring that AI development in healthcare aligns with public expectations.

Keywords: artificial intelligence, healthcare, public attitudes, high school students, healthcare professionals, AI implementation

Introduction

In recent years, artificial intelligence (AI) has become a major driver of progress in the healthcare sector, having improved the efficiency and effectiveness of various repetitive tasks and has started to be implemented in clinical settings (MacDonald et al., 2022). For instance, AI systems have been used in telemedicine to automate routine work such as appointment booking and in surgical settings to improve diagnosis capabilities (Lee & Yoon, 2021). However, the general public's concerns about AI have slowed down its full integration into healthcare (Roppelt et al., 2024). For instance, Witkowski et al. (2024), after surveying 600 adults in Florida, found feelings of distrust towards AI and nervousness about potential lower-quality physician-patient relationships. Yet, public opinion is not one-sided, as evidenced by Wu et al. (2023), who found AI's perceived ability to reduce inefficiencies was a point of optimism for many. This range of opinions is further compounded by Gao et al. (2020), who analyzed 2315 social media posts about AI in healthcare and found a mix of both optimism and apprehension. Together, these results highlight the conflicted nature of opinions held on AI in healthcare and indicate a need for a clearer understanding of the public's attitudes.

Implementing an initiative as large as AI in healthcare hinges on public trust and confidence; therefore, understanding these perspectives is imperative. This notion is further supported by the fact that public

sentiment is already a well-established predictor of technology adoption (Marikyan et al., 2023). However, current research predominantly focuses on the abilities of the technology and the potential benefits and inconveniences, causing a gap in focus. Additionally, the existing literature focusing on attitudes mainly samples healthcare professionals and older adults, leaving the perspectives of younger populations, particularly high school students, largely unexplored. This gap is significant as this population represents the people who will live in a society where AI is more readily used in healthcare. There are also very few studies looking at Canada, despite it being a global leader in both AI and healthcare. Furthermore, the mere nature of AI's constant development necessitates up-to-date research.

To address this gap, my study employed a Likert scale survey to quantitatively measure the attitudes of high school students and healthcare professionals to establish initial trends. An optional interview component with open-ended questions followed the survey and allowed participants to provide more context to their survey answers. Thematic analyses of these interviews further elucidate the recurring points of confidence and concern. Effectively, this study aimed to compare the views of the under-researched demographic of high school students with those of healthcare workers in Toronto, Canada. This leads to the research question: do the attitudes towards AI in healthcare differ between high school students and healthcare professionals, and if so, how? The findings of this study could inform healthcare policymakers and governments, providing insights to ensure future AI technologies are introduced in ways that align with the expectations and needs of current and future generations.

Literature Review

Assessing public attitudes entails subjectivity. Individual views towards wide-reaching topics are heavily influenced by experiences that are unique from person to person. Consequently, exploring the attitudes held by the public towards healthcare and AI, two large and actively growing aspects of society, necessitates a thorough understanding of existing data.

The Existing Research

The existing literature on this topic reveals both hopeful and cautious perspectives from the general public. Collectively, the conclusions and findings of the literature hint toward a broad range of public opinions, which sometimes vary when looking at specific demographics or aspects of AI in healthcare.

Concerns

Despite the limited presence of AI in healthcare systems so far, people have still expressed concerns about the possibility of AI being introduced more prominently in healthcare. Witkowski et al. (2024) surveyed 600 adults in Florida and found that many expressed distrust towards AI in healthcare, worrying that the quality of physician-patient interactions would deteriorate. This sentiment of distrust is also seen in online settings, as evidenced by the findings of Gao et al. (2020), which show that the majority of social media posts expressing concern towards AI in healthcare did so due to worries about unreliability and privacy issues.

However, these findings are challenged by Beets et al. (2023), who reviewed 11 publicly available surveys on AI in healthcare in the United States, finding that while most participants acknowledged AI's potential for healthcare, many struggled to explain its specific applications. This suggests that some opinions held by the public may be based on preconceived notions due to a lack of first-hand exposure to AI tools in healthcare (Abdullah & Fakieh, 2019). Esmaeilzadeh et al. (2021) substantiate this, finding in their experimental study that physical exposure to real-life AI healthcare systems had a considerable influence on participants' concerns about AI. Together, these results indicate that education to familiarize the public with AI tools could better inform their opinions, especially their concerns, on AI in healthcare.

Optimism

Optimism is not missing from the public opinion, however. Fast and Horvitz (2017), for instance, observed an increase in positive discussions about AI in healthcare since 2009, alongside a growing demand for AI education, suggesting that there is a willingness and curiosity from the public to learn more about these technologies.

Additionally, Wu et al. (2023) note that both healthcare providers and patients view AI as a useful tool to reduce operational and logistical inefficiencies or improve waiting times. They also find that improved algorithms allow AI to be viewed in a positive light (Wu et al., 2023). This is supported by Fritsch et al. (2022), who analyzed patient perceptions in Germany and found that optimism toward AI in healthcare is usually grounded in the hope that it can improve access to healthcare resources for underserved populations and reduce overall costs for society as a whole. Lastly, Antes et al. (2021) point out that the public's openness to AI in healthcare is likely largely influenced by its ability to improve convenience and access, having discovered that trust in healthcare systems is strongly correlated with optimism.

Demographics

Certain studies have also looked to understand whether specific demographic markers shape attitudes towards AI in healthcare. Antes et al. (2021) and Fritsch et al. (2022), for example, did so with gender and age. Regarding gender, they found that females were more skeptical and less open than their male counterparts (Antes et al., 2021; Fritsch et al., 2022). Regarding age, they, alongside Rony et al. (2025), found that younger participants generally showed more openness and optimism towards AI usage, whereas older groups were more cautious (Antes et al., 2021; Fritsch et al., 2022).

Additionally, Laï et al. (2020) found, in their analysis of French healthcare professionals, that, while the benefit is acknowledged, healthcare professionals tend to voice their concerns on the ethical handling of health data and the effect on patient relationships. Furthermore, Teng et al. (2022), who looked at healthcare students across Canada, found that the "majority reported a positive outlook" (p. 14). The only available study on the high school population, however, deviates from these results, finding that high school students generally distrusted AI and were not that familiar with the technology (Parmar, 2024). That said, the results of this study ultimately contradict this conclusion.

The Gap

Current research reveals a spectrum of public opinion on AI in healthcare filled with conflicting opinions, particularly from older demographics, such as healthcare professionals, who exhibit both hope and skepticism. While many gaps exist in the literature on this topic, the most prominent one is the lack of focus on the younger population, who represent the next generation of healthcare decision-makers and recipients. Preliminary indications suggest that high school students may have a more optimistic view of AI in healthcare than healthcare professionals who often handle the ethical and practical implications of such technologies. However, further research is essential to clarify the range of opinions seen in the literature, which raises the question: do the attitudes towards AI in healthcare differ between high school students and healthcare professionals, and if so, how?

Methodology

This study employed an explanatory sequential mixed-method approach. This entailed collecting and analyzing initial quantitative data to identify trends, followed by qualitative data collection informed by the quantitative results to explain these trends in depth. The study was also approved by an ethics committee beforehand to ensure that the well-being of participants would not be compromised.

Quantitative Data Collection

The quantitative portion of this method involved administering a survey to all the participants. The survey was distributed using Google Forms and shared through in-school communication for the high school students and email for the healthcare professionals, with the help of an expert advisor and a school alumni network.

At the beginning of the survey, participants were given a form of consent and reminded of their right to withdraw and the anonymity of their data to protect their privacy. The survey then started with six demographic questions to gather background information

on age, gender, education level, and familiarity with AI. Following this, 13 Likert-scale questions were administered to assess the attitudes of AI, ranging from optimism, confidence, and concerns.

Qualitative Data Collection

Building on the quantitative results, the qualitative portion involved conducting semi-structured interviews with a subset of survey respondents who expressed interest in participating further.

The majority of these interviews were held through Google Meet, with the exception of a few in-person meetings that were recorded using Voice Memos. The purpose of these interviews was to explore the reasons behind participants' views by gaining context behind specific survey findings. The structure of the interviews and some of the questions used were based on previous studies conducted by Parmar (2024), Nair et al. (2024), and Laï et al. (2020).

Analysis

Once the interviews were conducted and recorded, the recordings were transcribed using Riverside AI's automatic transcribing software. The transcriptions were then separated into high school student and healthcare professional categories. Then, a thematic analysis was manually performed on each transcript. Each transcript was read twice over to identify recurring themes and ideas. Then, several quotes from the transcriptions were selected to accompany each theme. The collected themes and quotes were then distilled to only keep the prevalent ones (those with the most occurrences across the interviews). These themes were then compared with the quantitative data and collectively analyzed to find similarities, discrepancies, or unexpected results, which are elaborated upon in the discussion section of this paper.

Justification

Given the extensive nature of AI and healthcare in general, an explanatory sequential design was chosen to ensure a broad understanding of the ideas while still allowing for nuance in individual responses. The quantitative survey was intended to provide an overview of the trends in attitude by analyzing average Likert Scale values and the shape of the graphs, while the qualitative phase served to provide the context behind these trends. This combined approach enabled the study to accommodate a large number of responses, all while considering the subtle differences within participants' attitudes.

Findings

This study had 68 participants: 59 high school students and nine healthcare professionals. The survey quantitatively assessed the general attitude of the participants through four categories: confidence, concerns, ethical and regulatory considerations, and practical applications. Participants could select one out of five options ranging from strongly disagree to strongly agree, as per the 5-point Likert scale.

Following the survey, 15 interviews (eight high school students and seven healthcare professionals) were conducted, which gave qualitative insights into participants' attitudes. A thematic analysis was then conducted to find common themes.

Quantitative Findings (Survey Results)

This portion contains the Likert scale questions. For the analysis purposes, numerical values will be assigned to each of the Likert options: Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly Agree (5).

Demographic Questions

The survey began with demographic questions to identify high school students and healthcare professionals. Questions on gender and self-identification as either a high school student or a healthcare professional are excluded from the following figures, due to demographic imbalance and redundancy, respectively.

Initially, 61 participants reported that they were familiar with artificial intelligence, with seven responding neutrally or not familiar with artificial intelligence. None of the healthcare professionals reported neutral or below for familiarity. See Figure 1 for more details.

Fourteen participants reported that they were familiar (selected strongly agree/agree) with how artificial intelligence was used in healthcare, with eight being healthcare professionals and six being high school students. See Figure 2 for more details.

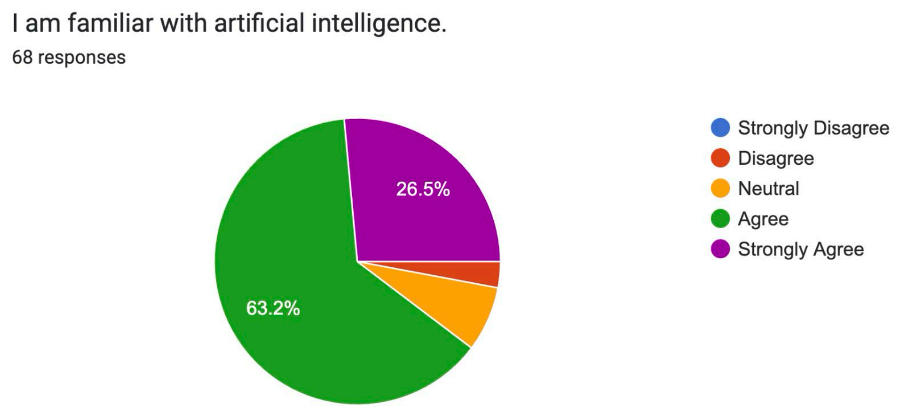

Figure 1: Question 4

Ten respondents reported that they had interacted with or used AI-based tools in a healthcare setting, with six being healthcare professionals and four being high school students. See Figure 3 for more details.

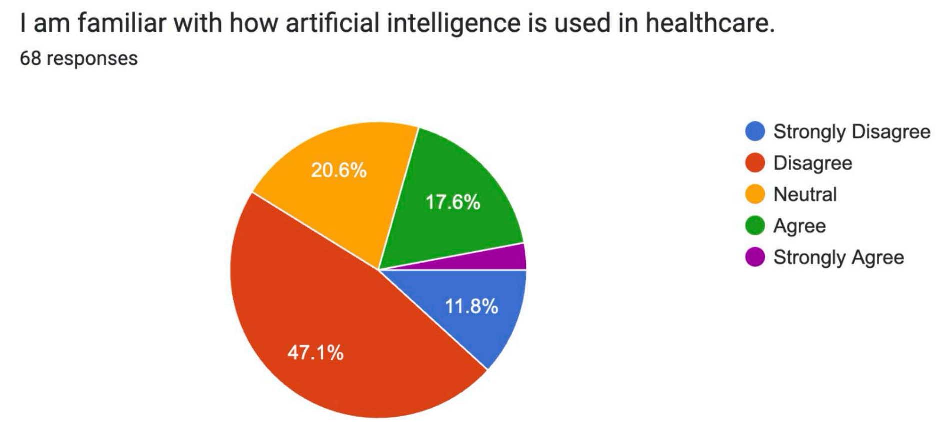

Figure 2: Question 5

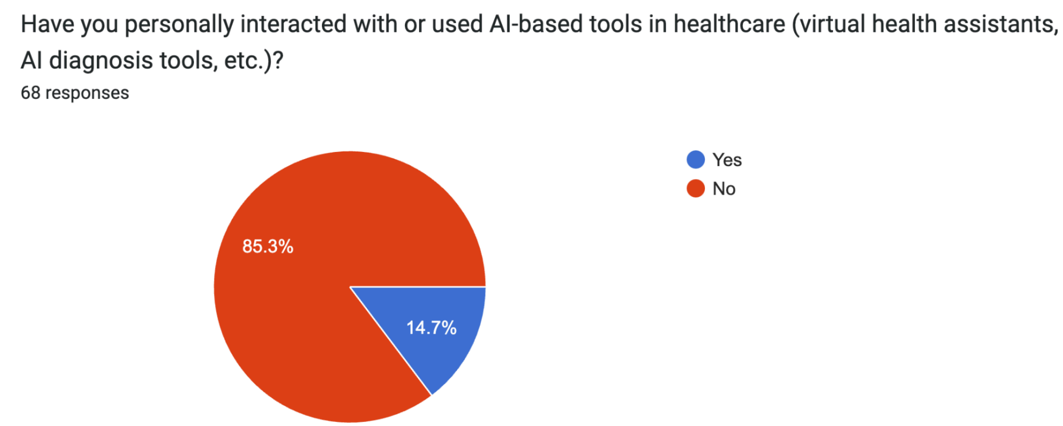

Figure 3: Question 6

Analysis Questions

Part 1: Confidence in AI in healthcare

The majority agreed that AI would significantly improve healthcare quality. However, when asked whether AI could make medical decisions as accurately as a human doctor or whether they trust AI for medical recommendations, responses for high school students followed a general bell curve distribution, while healthcare professional responses were slightly skewed to "Agree".

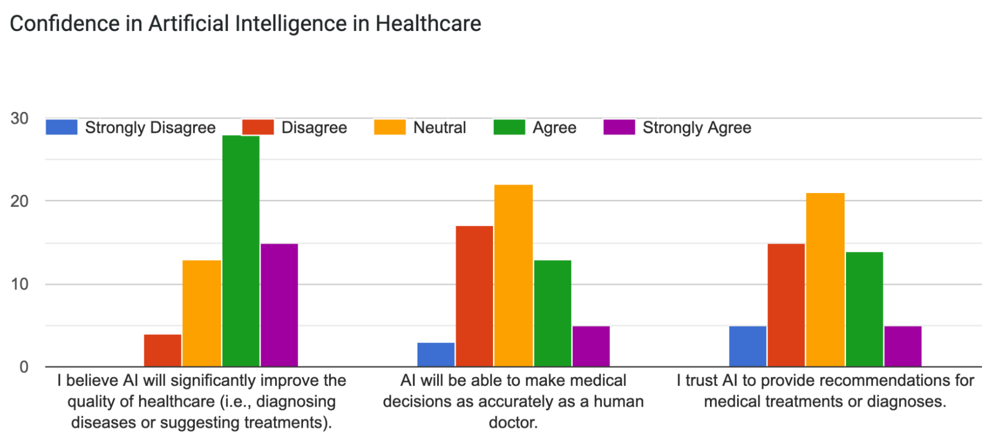

Figure 4: Questions 7-9 Results (High School Students)

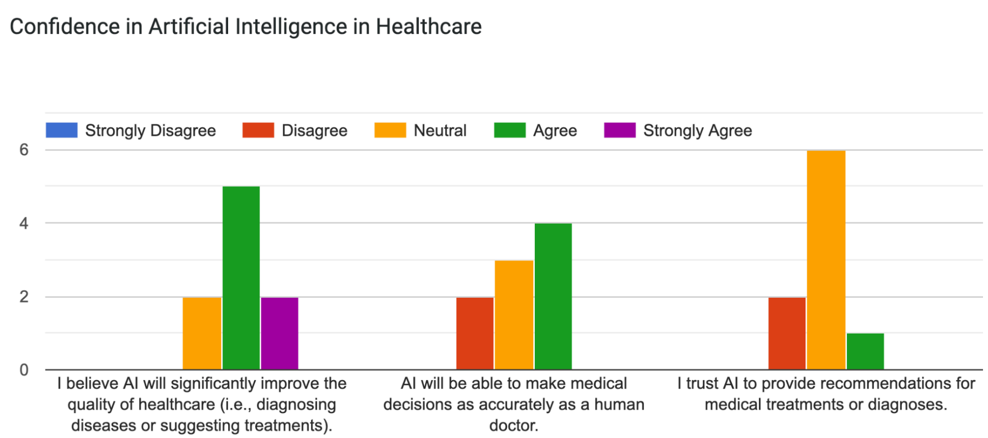

Figure 5: Questions 7-9 Results (Healthcare Professionals)

	Average Value High School Students	Average Value Healthcare Professionals
Question 7	3.900	4.000
Question 8	3.000	3.222
Question 9	2.983	2.889

Table 1: Questions 7 - 9 Likert Analysis

Part 2: Concerns about AI in healthcare

For high school students, the questions regarding AI replacing human doctors, its potential biases, and whether it might prioritize efficiency over patient well-being, all followed a bimodal distribution, with "Disagree" and "Agree" being the most selected options. Neutrality was demonstrated with privacy concerns, however. With healthcare professionals, thoughts on concerns were more skewed, with the questions about replacement and bias being skewed to "Disagree" and "Agree", respectively. A bimodal distribution was observed with the questions about data privacy and AI priorities.

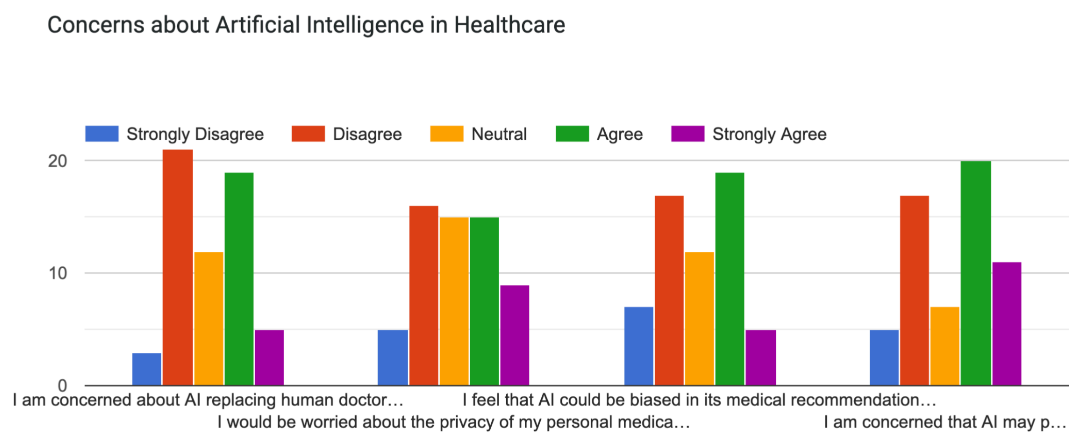

Figure 6: Questions 10-13 (High School Students)

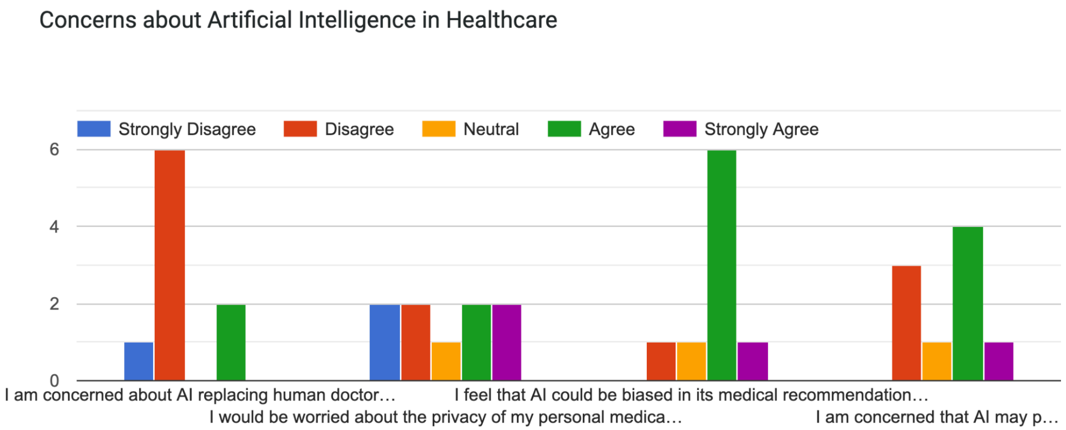

Figure 7: Questions 10-13 (Healthcare Professionals)

	Average Value High School Students	Average Value Healthcare Professionals
Question 10	3.033	2.333
Question 11	3.117	3.000
Question 12	2.967	3.778
Question 13	3.250	3.334

Table 2: Questions 10 - 13 Likert Analysis

Part 3: Ethical and Regulatory Considerations of AI in Healthcare

All participants were generally in favour of the implementation and ethical considerations of AI in healthcare. With high school students, all three questions (about AI's external regulation, AI's role in medical decision-making, and patient's choice when using AI tools) were skewed to "Agree" or "Strongly Agree".

A similar trend was observed with healthcare professionals, with the exception of the last question, where professionals were more ambivalent on whether patients should have the choice to opt out of AI-assisted tools.

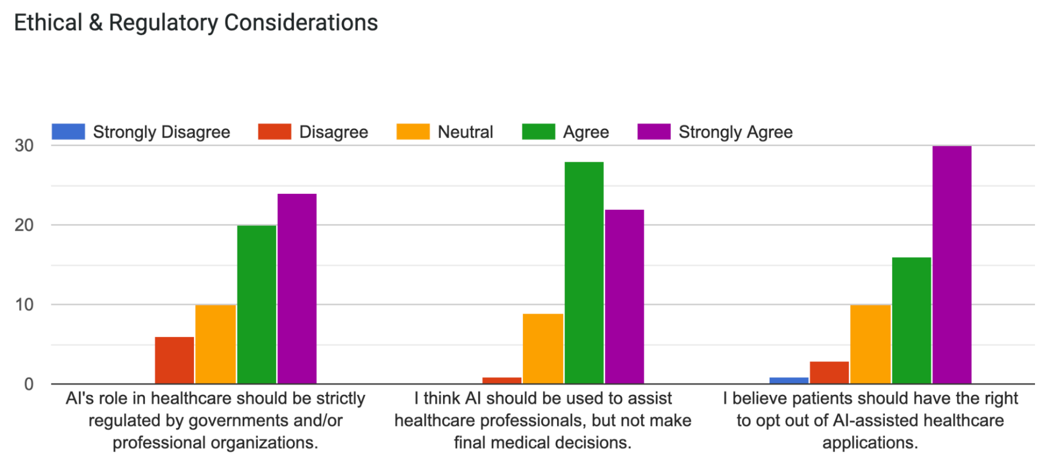

Figure 8: Questions 14-16 (High School Students)

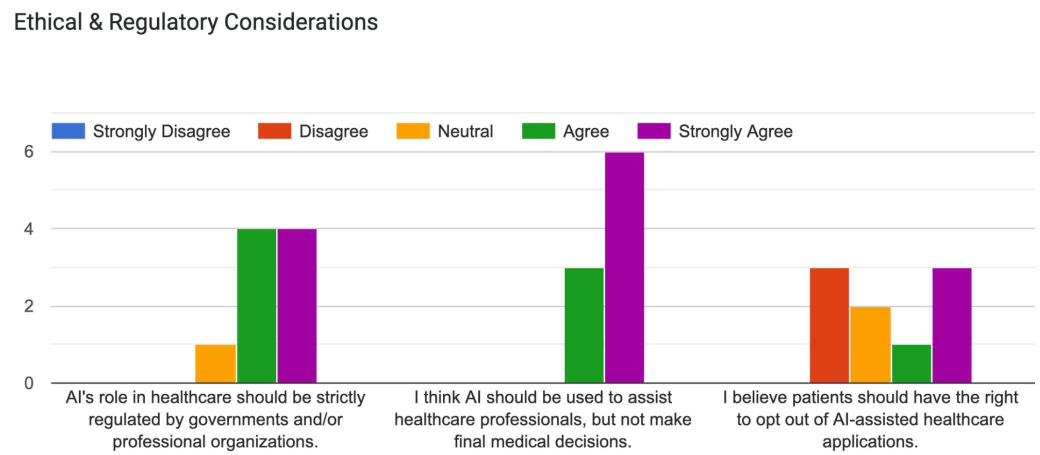

Figure 9: Questions 14-16 (Healthcare Professionals)

	Average Value High School Students	Average Value Healthcare Professionals
Question 14	4.033	4.333
Question 15	4.183	4.667
Question 16	4.183	3.444

Table 3: Questions 14 - 16 Likert Analysis

Part 4: Practical Applications of AI in Healthcare

Both high school students and healthcare professionals believed that AI could contribute to more personalized healthcare, and that they would be open to using AI tools themselves, with their responses both being skewed to "Agree" or "Strongly Agree". However, when asked whether AI should only be used in administrate settings, high school students generally expressed neutrality while healthcare professionals expressed slight disagreement.

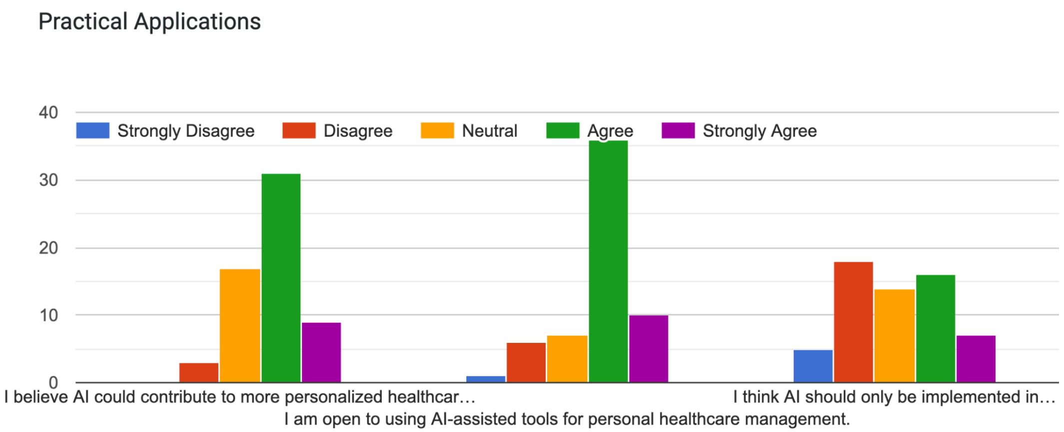

Figure 10: Questions 17-19 (High School Students)

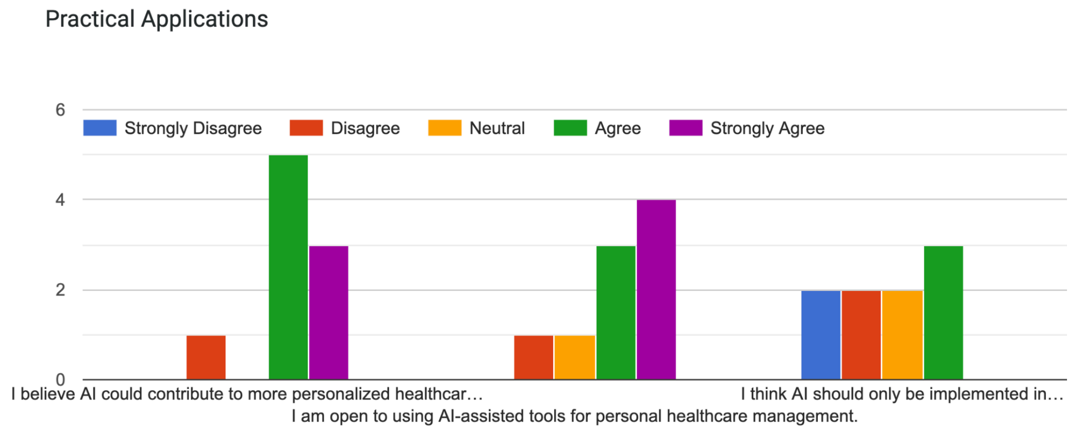

Figure 11: Questions 17-19 (Healthcare Professionals)

	Average Value High School Students	Average Value Healthcare Professionals
Question 14	3.767	4.111
Question 15	3.800	4.111
Question 16	3.033	2.667

Table 4: Questions 17 - 19 Likert Analysis

Qualitative Findings (interview results)

The interviews were used to conduct a thematic analysis to identify and analyze recurring trends in the high school student and healthcare professional subgroups.

Thematic Analysis Findings

Thematic analyses of the interviews found several themes within the participants' attitudes towards AI in healthcare. Some of the major themes from this portion were:

1. Trust in AI and Its Capabilities

Students expressed skepticism about AI's current reliability, given that it is a relatively recent implementation. They were, however, hopeful for the future, with most expecting AI to eventually be able to make medical decisions with the same, if not greater, accuracy as human doctors. Healthcare professionals acknowledged AI's potential but emphasized its current and potential future limitations. Due to this, many believed that patients are more likely to trust human doctors over AI systems, and suggested that there is a need for some sort of human input in all decisions.

2. Ethical Issues and Bias

Few students touched on the ethical concerns of using AI to handle data, but the majority referred to the intrinsic human bias in the training data used for AI, which would consequently result in biases in the AI as well. Professionals emphasized that AI being trained on data that reflects existing disparities in healthcare (i.e., racial or socioeconomic biases) would only exacerbate these problems further.

3. Influence of AI in Healthcare

Many students recognized and supported AI for administrative tasks, but not for making final critical medical decisions. Healthcare professionals regarded AI as unusable for final critical medical decisions and saw more specific uses in radiology and predictive analytics.

4. Limitations of AI

Students believed that AI's lack of emotional intelligence renders it incapable of making decisions that involve human compassion. Similarly, healthcare professionals acknowledged the limitations of AI, particularly its inability to pick up on subtle, often subjective, cues that professionals can.

5. Regulation of AI

Nearly all students agreed that AI should be used as a tool to support healthcare professionals, not replace them. The regulation and oversight of AI, potentially through government bodies, were also deemed to be an important factor. Healthcare professionals stressed the importance of having a clear system of accountability, especially for situations where AI makes an error. All professionals believed that liability should fall on the overseeing physician if they were to work with AI, with many referencing the current "most responsible physician" system used in many healthcare systems.

Discussion

Differences were found in the attitudes of high school students and healthcare professionals. While both groups recognized the potential of AI to improve healthcare efficiency as a whole, their confidence, concerns, and ethical considerations for both the present and future differ. These results attest to the conflicting public opinions found in existing research, yet simultaneously stress the importance of understanding these perspectives to ultimately inform future decisions and initiatives involving AI in healthcare to, at the very least, consider public views.

Confidence in AI's Capabilities

Both the survey results and thematic analysis revealed that all participants believed AI would improve the quality of healthcare in some way. However, the confidence in AI's ability to make medical decisions, especially at the level of human healthcare professionals, was more ambivalent between the two groups. High school students, for example, were more neutral in the survey, but more optimistic during interviews, with many citing AI's near-unlimited learning abilities that could be funneled back into optimizing it. On the other hand, healthcare professionals were slightly more reserved, emphasizing the limitations of AI in situations involving rare diagnoses or uncommon patient interactions. This disparity was reinforced through the thematic analysis, where many healthcare professionals stressed that AI's lack of subjective judgment and empathetic reasoning makes

it unsuitable for the type of patient care healthcare is built for. While high school students emphasized this, they were also considerably more concerned about AI replacing human healthcare professionals than the professionals themselves. This disparity is likely a result of differing levels of exposure to healthcare AI technologies (as shown in Figure 2), media and education influences, or personal beliefs about technological advancement as a whole. This aligns with previous research, showing that younger populations exhibit greater openness to AI, whereas professionals maintain a more cautious position due to pragmatic concerns (Antes et al., 2021; Laï et al., 2020; Teng et al., 2022). It also aligns with other research, where job replacement was seen as a major fear in the implementation of AI (Abdullah & Fakieh, 2019; Derakhshanian et al., 2024).

Concerns and Ethical Issues

Although general concerns surrounding AI in healthcare were prevalent in both groups, they varied slightly in nature. High school students focused less on ethical and privacy concerns, rather voicing their concerns about the current abilities of AI, believing it to be insufficient for current use in non-administrative settings. Healthcare professionals, on the other hand, mentioned the ethical challenges associated with AI but still emphasized a different problem: the lack of clarity on how an AI makes decisions. Despite this, however, healthcare professionals were still open to limited clinical uses of AI in healthcare, such as in radiology or predictive analytics. These findings are consistent with Stewart et al. (2023) and Hamedani et al. (2023), who found that most medical students, physicians, and nurses selected specialties and aspects such as radiology, pathology, medical tests and imaging where AI would be implemented or most likely to be impactful. Additionally, both groups agreed that AI had a level of emotional intelligence that rendered it unsuitable for personal, one-on-one patient interactions. Similar skepticism is noted in other studies, where participants often consider AI insufficiently flexible for intricate patient interactions (Rony et al., 2025; Sabra et al., 2023; Smoła et al., 2025).

Another major trend and concern that arose in the surveys and interviews was bias. High school students showed a broad awareness of bias, with many speculating the presence of human bias in the data used to train AI, which would affect the AI itself. Healthcare professionals also recognized this but were more worried about the implications, particularly the potential for existing disparities in healthcare due to human bias to be entrenched further, a concern that was also observed by Wu et al. (2023). Racial-based and gender-based biases were mentioned frequently. That said, both groups suggested the idea of using larger data sets when training AI to minimize bias and subsequently make AI as generalizable as possible.

There was minimal mention of AI handling data and the associated privacy concerns in the interviews. This contradicts the findings of Gao et al. (2020), who identified AI data handling as a large public concern, as well as the broader discussions on AI implementation, where data handling is a central focus of future healthcare policy (WHO, 2021). Collectively, these findings suggest that transparency on AI's functionality, data handling, and its decision-making processes, and education on the privacy challenges, could help alleviate the trust gap.

The Future Role of AI in Healthcare

A major aspect of the interview data was the suggested role of AI in healthcare. All interviewed participants fully supported the continued usage of AI for routine administrative tasks in healthcare settings. In non-administrative settings, where AI would likely play a more active role, both groups agreed that AI should play a supporting role rather than a lead one. In fact, participants consistently emphasized that healthcare professionals should retain greater influence than AI systems in these non-administrative settings, ensuring that the AI serves as an aid rather than the final decision-maker. For many participants, this was due to the healthcare professionals' years of training and perceived ability to handle anomalous situations more effectively. This is consistent with Fritsch et al. (2022), who found that AI is most widely accepted when used as a tool to enhance, not replace, human expertise. During the qualitative interviews with the healthcare professionals, many compared AI to self-driving cars, and how, like the cars, AI systems in healthcare must be tested strictly and in many different conditions before even being considered for release to the public.

Additionally, three healthcare professionals suggested some specific use cases of AI in non-administrative settings, such as in radiology, in analytics, and as replacements for expensive tools. Together, both groups exhibit a cautious yet hopeful look toward AI in the future through the shared lens of valuing the expertise and capabilities of human healthcare professionals.

Implications for Policymakers and AI Implementation

The findings of this study have several implications for healthcare policy and AI development in the future. First, transparency in AI decision-making processes must be prioritized to build trust among healthcare professionals and high school students. A concern raised during the interviews was the lack of clarity regarding how AI systems arrive at decisions, which participants noted contributed to uncertainty and reduced trust. This underlines the value of open discussions regarding AI's functionality to allow for confidence as it is being implemented. Second, educational initiatives aimed toward both younger and older populations should expand to teach beyond AI's capabilities and include proper usage and ethical considerations as well. This is also consistent with the findings of Rony et al. (2024) and Stewart et al. (2023), who found that people see value in incorporating AI topics or handling in formal education or training.

Additionally, given the variance in the two groups' views depending on the question, educational or discussion-promoting initiatives should be tailored to the population. For instance, education for younger people could focus on AI's limitations, while professional development for healthcare professionals could focus on ethical frameworks and bias prevention. Lastly, almost all participants emphasized the importance of regulatory guardrails for AI, at least in its early implementation, to prevent misuse. Therefore, regulatory laws in the early stages of AI's implementation should emphasize AI's role as an assistive tool to maintain human oversight in decision-making. As AI is used more in healthcare, promoting discussions on bias, data privacy, and the long-term societal impacts through education will ensure that current and future generations approach it responsibly.

Limitations and Future Research

Given the 8-month time frame for this study, one of the major limitations was gathering participants as a whole. The sample size, particularly for healthcare professionals, was small compared to the number of high school students, limiting the generalizability of findings. A lack of engagement from nearby schools limited the female participants in this study, thereby reducing the overall demographic balance in the participants. Additionally, interview responses from high school students interestingly revealed a bit more optimism than the survey results suggested, highlighting a potential gap due to the self-reported and structured nature of the survey and interview, respectively. Future research should explore different demographic groups, both narrow and broad, through longitudinal research designs to assess how perceptions and attitudes evolve as technology inevitably advances. Incorporating larger sample sizes would also be beneficial to allow the findings to be generalized and applicable to larger populations.

Conclusion

This study highlights the nuanced perspectives on AI in healthcare, which reveal generational differences in confidence, concerns, and suggestions. While high school students generally view AI as a promising innovation, healthcare professionals remain cautious, recognizing both its existing and future limitations and ethical challenges. The implementation of technologies as powerful as AI demands public input, and these findings collectively demonstrate the importance of public education and transparency required to achieve this. Accordingly, perspectives across all age groups must be considered. While current healthcare professionals represent the modern view of AI as it is slowly being implemented, high school students represent the values and attitudes of the recipients and leaders of these very AI technologies as they are more widely implemented in the future. Consequently, addressing these information gaps through education, policy, and responsible AI development will be imperative to ensuring the widespread acceptance and ethical integration of AI in healthcare systems worldwide.

ATTITUDES TOWARDS AI IN HEALTHCARE

Further Reading

For original appendices and additional data, please go to **this page**.

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