

Assessing the Integration of Artificial Intelligence in Telemedicine: Public Trust, Awareness, and Ethical Frameworks

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Abstract:

Artificial Intelligence has increasingly become a key component in telemedicine. Improved remote diagnosis, patient triaging, continuous monitoring, and engagement. Public perceptions have a vital role to play in shaping the future of telehealth amid its rapid rise with responsible deployment of AI-enabled health care systems. This study seeks to investigate user awareness, trust, benefits, and ethical concerns related to AI in telemedicine, when a poll of a total of 101 participants was conducted. The results indicate that even though most of the participants are aware of the existence of AI, Applications in healthcare, direct experience with such systems is scant. It highlighted a few benefits: speedier preliminary assessments, ease, and more access to health services. However, a number of concerns relating to data were noted: Privacy, diagnostic accuracy, algorithmic fairness, and minimizing human interaction. AI's trust Predominantly, responses were conditional. Several participants would like AI systems to operate under clinician supervision. Such findings reinforce the importance of robust factors include governance, rigid privacy measures, and human-centered design to build trust.

The study concludes by proposing an ethical framework to ensure safe and responsible integration. incorporation of AI into telemedicine practice.

Keywords—Artificial Intelligence, Telemedicine, Healthcare Technology, Public Perception, Patient's Trust; Ethics of AI

I. INTRODUCTION

Telemedicine plays a crucial role in the current healthcare system by offering patients access to remote medical care. It utilizes electronic communication systems such access to medical advice, diagnoses, and continuing assessments. The evolution of health technologies has revolutionized the way healthcare service is

delivered, and Artificial Intelligence (AI) is becoming more integrated into telemedicine technologies to improve clinical decision-making, provide automated preliminary assessments, and enhance patient engagement. AI-based systems are able to analyse symptoms provided by a patient, interpret complex medical information, predict

potential risks, and aid in helping clinicians provide timely, accurate, and personalized care.

As technology evolves, it is vital for its adoption and usage to gain user acceptance and trust. Public perception significantly influences the practical application of AI-based health care solutions settings. Even though there are some advantages to using AI, it enhances efficiency and lessens costs, it also promises broader access to medical services; however, at the same time, there are issues of concern related to data privacy and accuracy, transparency, and ethics. A clear understanding of these perspectives is important, especially for policy makers. It is an open-source library that offers developers and healthcare professionals the opportunity to implement AI with a socially responsible approach.

This study examines public awareness, levels of trust, benefits, and ethical concerns related to the chosen theme. With regards to AI in telemedicine and based on survey results from 101 participants. The findings to emphasize the existing opportunities and challenges regarding the application of AI techniques for delivering Remote Healthcare services. Providing actionable insights for designing responsible, user-centric, and ethically managed AI systems. Through its exploration of both positive attitudes and doubts, the research stresses the importance of clear

governance, strong privacy protections, and a human-centered design approach to build trust among citizens to ensure safe integration of AI and telemedicine in clinical practice.

II. BACKGROUND AND RELATED WORK

Telemedicine is the new reality in the healthcare profession. It is all about availing a chat interface to patients, so they can receive a diagnosis, and monitor their health, wherever they may be. It seems to be a giant leap adding AI to that mix .AI can search through seldom identified symptoms, duct smartly propose to physicians, identify early danger, or even look after patients in a real - time method. These tools are used by people to accelerate virtual consultations, decrease waiting lists, and allow physicians to do a lot of work in the virtual environment.

The change that AI will bring to healthcare is supported by previous studies. According to big research, the AI-based systems presented on online medical sites demonstrated the sufficient management of millions of conversations, symptom-check bots, and referrals to the necessary care. Wearables and IoT devices provide an Impetus to AI-based remote monitoring to track vitals and give a red flag alert to ensure that chronic diseases remain within safe limits and care can step in before the situation escalates.

Regardless of all that, previous literature identified a list of hurdles. The risk of the information getting out of the hands and being exposed, the privacy concern, and the necessity of the algorithms that people are aware of are significant .Users are nervous because they are afraid of false diagnoses, prediction bias, or automation being too distant. Doctors prefer models that are understandable and elucidate, validated, and possess a framework to deploy AI at the level of responsibility to ensure the safety of patients , as well as continue believing in the system .

These general ways of research trends are endorsed in our survey of 101 people. Although healthcare professionals are aware of AI in the industry, participants reported that they have not been using teleconsultations with the assistance of AI in fact. They are concerned with their privacy as health data, human distrust in AI-generated recommendations and the necessity of human monitoring over the decision -making process. These results confirm the critical importance of introducing AI into the telemedicine field in a fair, open, and ethically controlled manner.

III. AI APPLICATION AND OPERATIONAL FRAMEWORKS IN TELEMEDICINE SYSTEMS

AI is indeed a disruptive technology in telemedicine. It improves the functioning of these systems, their efficiency, and response speed. Current platforms essentially add AI layers all over in terms of automated triage to automatic patient chat, reading data, and immediate assistance by clinician. They are designed in a way that it can process a large amount of patient data and make fast initial evaluations to allow the physician to make improved decisions with the aid of AI.

The automatic symptom checker is likely to be the largest application of AI. Chatbots and virtual assistants will take patients through a series of questions to better understand the questions to better understand the severity of things, identify risk factors, and instruct on the next course of action. This reduces the waiting time and allows clinicians to choose patients in order to urgency. Remote diagnostics is also enhanced by AI models that scan medical imagery ECGs, Skin scans, etc., to identify abnormalities and provide second opinion indications in digital check-ups.

In treating chronic illnesses, AI based surveillance systems retrieve real time information through AI as well, and such aspects as the scheduling and electronic records become more streamlined, as well as reminders. Predictive models give approximations of what patients will request and how many they will require, thus hospitals are more efficient in their operations.

The day-to-day workflow becomes optimised through AI as well, and such aspects as the scheduling and electronic records become more streamlined, as well as reminders. Predictive models give approximations of what patients will request and how many they will require, thus hospitals are more efficient in their operations.

Despite all that technology, the real trick is to build trust, deal with ethics, and strictly ensure that the model is in fact correct, which is what the 101 people mentioned and interviewed during the study brought up.

IV. ETHICAL, PRIVACY, AND TRUST-ENHANCING MITIGATION STRATEGIES FOR AI IN TELEMEDICINE

Artificial Intelligence in telemedicine poses some challenges ranging from data privacy, and transparency, trust, and clinical reliability, many of which were highlighted by the 101 participants surveyed. The issues raised here need to be addressed with a proper set of mitigation strategies to ensure the ethical, secure, and trustworthy use of AI-enabled remote healthcare systems.

The first strategy focuses on protection of data and confidentiality. The use of robust encryption, safe storage, and the other basic principles of safety,

security, storage, and restricted access are of prime importance for maintaining confidentiality of medical information

as that data misuse and privacy breaches were identified as primary concerns among respondents, telemedicine platforms need to establish transparent policies on data management, which need to be strictly adhered to healthcare regulations.

The second approach is to emphasize the accuracy and clinical reliability of AI models. This involves only through continuous testing, performance validation, and updating AI systems with diverse datasets can ethical AI systems be built. Survey participants showed little trust in fully automated diagnoses, pointing out the need for human intervention. A human-in-the-loop approach can be implemented in which the clinicians reviewing and confirming AI-generated outputs leads to not only improved diagnostic performance but also improved user confidence.

The third strategy is on algorithmic equity and bias reduction. AI systems should be taken through regular equity audits, demographic performance analyses, and bias-reduction processes to prevent inequitable or erroneous outcomes across diverse patient populations.

Another important measure is transparency and explainability improvement. Offering the end-users with the capability to better understand clear, comprehensible explanations of how the AI system is making recommendations while acknowledging system limitations which can reduce uncertainty and facilitate acceptance.

Subjects reported greater comfort when AI outputs were interpretable and clinically supervised.

It is also important that fully developed ethical governance frameworks be established for accountability. Telemedicine platforms should have mechanisms for ongoing monitoring and reporting of errors.

V. LITERATURE REVIEW

1) Jiang et al. (2021) studied the patterns of digital healthcare use by checking 35.3 million online doctor visits carried out on China's Ping an Good Doctor platform. The research showed trends in the

population, when the service was used the most and what types of services of people need. The results show that Ai-based telemedicine platforms are increasing and the need to understand user actions to improve the ability to handle more number of users and working of virtual healthcare systems.

2) Mehta et al. (2021) investigated telemedicine-based solutions for the treatment of ST-elevation myocardial infarction (STEMI) as part of the Latin America Telemedicine Infarct Network (LATIN). The results demonstrated that AI-assisted remote ECG interpretation and teleconsultation can reduce the time for diagnosis and patient transfer, thus confirming that AI-assisted telemedicine can enhance emergency cardiac care.

3) Shaik et al. (2021) conducted a review of Ai-assisted remote patient monitoring solutions for managing chronic diseases. The authors explained the concept of combining IoT-enabled wearable technology, machine learning algorithms and privacy-enhancing methods to facilitate continuous patient monitoring and timely clinical notifications. This review illustrates the application of AI in enhancing long-term patient outcomes.

4) Kumar et al. (2023) examined the remote patient monitoring system using artificial intelligence and its use in the healthcare industry. The authors described the structured of the remote patient monitoring system using wearable technology, cloud computing and data analysis and its benefits, which include early detection of deterioration. Obstacles to the implementation include data sharing and data management ability, system stability.

5) Chen et al.(2022) proposed and Ai-assisted approach for the remote diagnosis of St-elevation myocardial infarction from prehospital ECG recordings. The proposed deep learning approach ensured high accuracy in diagnosis and helped in the early detection of life-threatening conditions of the heart before hospitalization. This project proves the feasibility of real time AI-assisted monitoring and encourages the use of low-latency AI solutions in telemedicine-based emergency care.

6) Sharma et al.(2020) explored the practical challenges of using AI-based telemedicine systems. They included issues like trust, stable results every time, smooth merging into existing workflows and approval by clinicians. The authors pointed out that

AI in healthcare can work better when there are clear methods to evaluate it, proper plans for implementation and adequate training for clinicians.

7) Topol (2019) described how artificial intelligence is bringing major changes to healthcare particularly in area like diagnosis, remote patient monitoring and patient involvement. It mentioned that the important moral issues in telemedicine are those related to data privacy, openness and the need to design AI systems with people in mind.

8) Tran et al. (2023) performed a bibliometric study to identify trends in global research publications on artificial intelligence and telemedicine between 2010 and 2023. The study indicated a steady increase in publications per year, with the United States and China being prominent contributors. Some of the emerging trends in research included conversational AI, mobile health applications and AI-supported clinical decision support systems.

9) Bosch et al. (2021) introduced TIMELY, an AI-powered telemedicine solution developed to help patients during the rehabilitation phase following a heart attack. This solution integrates wearable health monitoring, personalized advice, risk prediction and lifestyle advice, proving that AI-powered telemedicine solutions can help patients after the initial treatment phase.

10) Tadesse et al.(2022) developed DeepMI, an AI system that can detect heart attacks and estimate when they began using ECG data from more than 17,000 patients. He system showed high accuracy, demonstrating that AI can support remote heart diagnosis in urgent medical situations.

11) Liu e al. (2021) proposed an emergency alarm system based on Ai to identify acute myocardial infarction earlier from 12lead ECG signals. This method improved the efficiency of triage and reduced the risk of incorrect diagnosis, illustrating the role of AI in improving emergency decision-making in telemedicine.

12) Asad et al. (2021) conducted a scoping review on the role of telemedicine and artificial intelligence in cardiovascular care during the COVID-19 pandemic. The study demonstrated how virtual consultations and AI-integrated monitoring systems helped maintain continuity of care when in-person services were restricted, emphasizing the importance of telemedicine in crisis-driven healthcare delivery.

13) Attia et al. (2019) developed an AI-based ECG algorithm that has the ability to identify patients at risk of atrial fibrillation even when the heart is in normal sinus rhythm. The results obtained by the study indicate that the model can predict with high accuracy, thus highlighting the potential of AI in the early detection and remote monitoring of serious and life-threatening heart conditions.

14) Elias et al. (2021) introduced EchoNext, an AI-assisted ECG analysis system intended for the detection of structural heart disease. The model demonstrated diagnostic ability comparable to, and in some cases superior to experienced cardiologists, exemplifying the potential of AI in assisting with early diagnosis in telemedicine settings.

15) Sreedharan et al (2021) conducted a systematic review and meta-analysis on the application of artificial intelligence in emergency and critical care. The study indicates very high diagnostic accuracy in triage, risk stratification and decision support, emphasizing the promising role of AI in improving telemedicine in high-acuity cases.

VI. METHODOLOGY

A. Text Research Approach and Goals

The study used both numerical data and detailed responses to understand people's awareness, trust, moral issues and approval of artificial intelligence in telemedicine. The quantitative approach will enable the findings of the understanding of AI-supported healthcare systems, and the qualitative approach will analyse the results to understand the worries of the users. The main purpose of this research is to relate the elements that impact the use of AI-based telemedicine systems and the worries related with privacy, precision and responsibility.

B. Data Collection and Questionnaire Design

A specific survey was created using Google Forms to collect data from a wide range of participants. The questionnaire consisted of questions with given options, rating scale questions and one question where participants could write their own answers. The questionnaire was divided into five sections which included knowledge of AI in healthcare, benefits and uses, privacy and moral concerns and purpose to use telemedicine systems enabled with AI.

This design used numbers to study patterns and collected detailed opinions from participants. The form was designed to be easy for everyone to use, including those who are not very familiar with technology.

C. Data Collection Procedure

The Google Form was posted online using social media platforms, messaging applications and academic networks. This ensured that the form was accessed by a wide range of participants. The participants were able to respond to the form voluntarily at their convenience. A total of 101 valid responses were obtained for analysis. The Google Form automatically summarized the data collected.

D. Sampling and Participant Information

Convenience sampling was used because the survey was conducted online. The target participants included a range of age groups, educational background and professionals such as students, employees and people who are familiar with digital health solutions. This was important because the study would be able to collect different opinions on AI-based telemedicine solutions and understand the common worries and what people expect from them.

E. Data Analysis Techniques

The quantitative data was analysed using summary charts provided by Google Forms, such as percentages, frequency distribution and graphical representations. These analyses were conducted to find trends in people's awareness, trust, opinions on usefulness, willingness to use the AI system and the risks they sense. The qualitative data was carefully reviewed to identify common ideas like trust, fear of wrong diagnosis, the need for human involvement and concerns about data security.

F. ETHICAL CONSIDERATIONS

The participants were informed of the academic purpose of the survey before taking it up. The survey was voluntary and no personal information was collected. All the responses were anonymous and kept secure. The ethical standards were upheld by being transparent and keeping the information of the participants private and using it for academic purposes only.

VII. ANALYSIS AND INTERPRETATION

A. Awareness of AI in Telemedicine

TABLE I

Percentage Distribution of Awareness

Response Option	Percentage(%)
Yes	64.4
No	35.6

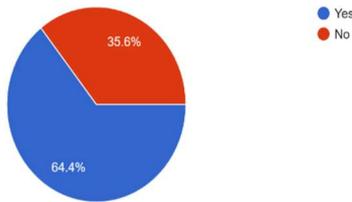


Fig 1 Percentage Distribution of Awareness

Most participants, or 64.4%, were aware of the AI usage associated with telemedicine, suggesting awareness of digital healthcare tools. However, the percentage of 35.6% who are not aware highlights a knowledge gap, implying that the rate at which AI is being integrated into the field of healthcare is outstripping public understanding. This underlines the necessity for education and information communication in order to facilitate awareness and informed adoption.

B. Usage of Telemedicine Platforms

TABLE 2

Telemedicine platforms used

Platform	Percentage(%)
Ping An Good Doctor	17.8
Practo	12.9
Teladoc	10.9
Doctor on Demand	22.8
Other	17.8
Not Applicable	45.5

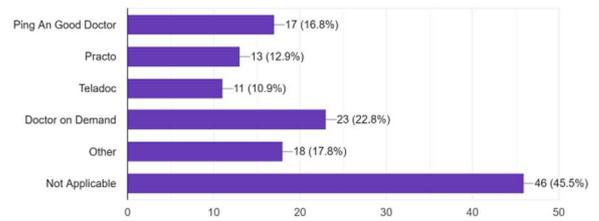


Fig 2 Telemedicine platforms used

Doctor On Demand was the most frequently used platform, accounting for 22.8%. Followed by major platforms. The high percentage of respondents that answered “Not Applicable” (45.5%). This suggests that a considerable amount has not utilized the telemedicine services despite their knowledge of the services. Such a gap between knowledge and practice suggests there may be barriers, for instance, in their preference for in-person consultations, unfamiliarity with digital Tools, Or Perceived Lack Of Necessity.

C. Confidence in AI’s Ability to Assist Doctors

Table 3

Confidence Levels (1–5 Scale)

Rating	Percentage(%)
1	14.9
2	11.9
3	32.7
4	30.07
5	9.9

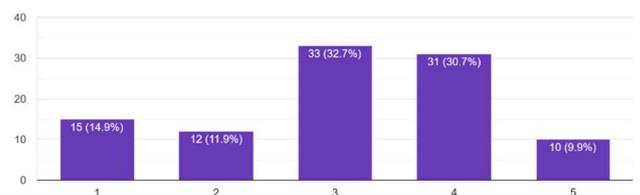


Fig 3 Confidence Levels (1–5 Scale)

Respondents' levels of confidence in AI assistance were mainly in the range of 3 to 4. This is to reflect that the respondents moderate trust in AI’s role in supporting clinical decision-making. Only 9.9% expressed full confidence (level 5), suggesting that even though users express a sense of cautious

optimism towards the support provided by AI, they still prefer human oversight. This implies that the role of AI is perceived as complementary until now rather than a replacement for healthcare professionals.

D. Perceived Accuracy of AI vs Human Doctors

TABLE 4

ACCURACY RATINGS (1-5 SCALE)

Rating	Percentage(%)
1	9.9
2	14.9
3	40.6
4	26.7
5	7.9

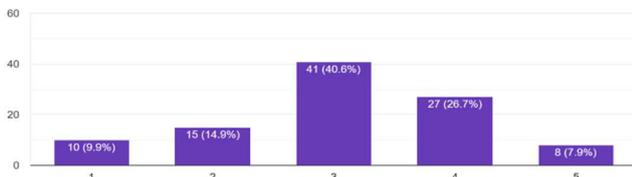


Fig 4 Accuracy Ratings (1-5 Scale)

Accuracy of AI is centered around a peak of 40.6% at level 3. This implies that the user finds AI reliable but not quite comparable to human expertise. Only a small fraction (7.9%) believed that AI was totally accurate, which shows that trust in AI’s decision-making ability is still limited. It seems that users receive AI as a helper rather than a substitute for clinician judgment.

E. Concerns About AI in Healthcare

TABLE 5

MAJOR CONCERNS

Concern	Percentage(%)
Privacy of Data	54.5
Accuracy of Diagnosis	42.6
Lack of Human Touch	55.4
Misdiagnosis	38.6
Data Misuse	33.7
Other	15.8

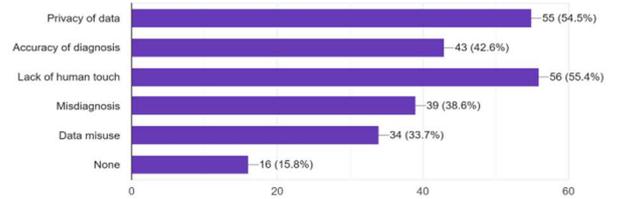


Fig 5 Major Concerns

The most prominent issues were lack of human touch (55.4%), data privacy (54.5%), reflecting emotional and ethical apprehensions about integration with AI. Diagnostic accuracy (42.6%), risk of misdiagnosis (38.6%), and potential data misuse (33.7%) were significant issues. Furthermore, these results indicate that user trust is more likely to be driven by interpersonal and social aspects of computer-mediated communication rather than ethical considerations than by technological performance alone.

F. Willingness to Recommend AI-Enabled Telemedicine

TABLE 6

RECOMMENDATION INTENT

Response	Percentage(%)
Yes	32.7
No	22.8
Depends	44.6

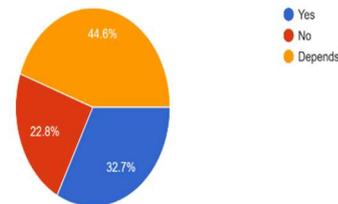


Fig 6 Recommendation Intent

Almost half of the respondents (44.6%) expressed conditional acceptance, which suggests that the willingness to recommend AI-enabled telemedicine depends on certain parameters such as accuracy, data security, and human supervision. Only 32.7% were willing to recommend the technology outright. This, in turn, underlines the significance of factors like transparency, trust, and

algorithmic accuracy in the context of promoting increased trust and usage by the public.

VIII. Results and Discussion

This section presents the findings from the analysis of 101 survey responses and interprets their implications for AI-driven telemedicine. The findings are in line with the study objectives pointed out by the examination of public awareness, usage patterns, trust dynamics, and concerns related to AI-enabled healthcare interactions.

A. Knowledge of AI in Telemedicine

The findings revealed that 64.4% of the respondents are aware that the AI technologies are implemented into telemedicine platforms, a fact that reflects the growing public acquaintance with digital health solutions. However, 35.6% of the participants reported no awareness, which is a considerable knowledge gap. This thus suggests that, in reality, AI adoption in healthcare is moving more much more quickly than public understanding, underlining the need for focused education and effective communication is necessary for wider acceptance.

B. Adoption of Telemedicine Platforms

Meanwhile, knowledge about it is not withstanding, the real utilization of telemedicine services remains very low. Approximately only 45.5% claimed no affinity for the use of any of the above channels. Among users, Doctor On Demand turns out to be the most used, followed by other international telemedicine applications. The difference indicates that there are obstacles, such as preference for in-person care, limited digital literacy, and necessity. These findings highlight the importance of enhancing accessibility, user experience, and trust to increase adoption rates.

C. Trust and Perceived Accuracy of AI-Assisted Healthcare

The respondents reported a moderate level of trust in AI-supported clinical services, most confident ratings were mainly focused in the middle of the ratings. AI was also recognized as something of value for use in preliminary decision-making, only a small portion of respondents completely believed in its ability to provide independent diagnoses. This

measured perspective underscores the preference for AI as a supportive tool for clinicians and not as a replacement. The users view AI as enhancing efficiency while requiring oversight by a human to provide reliable and accountable health results.

D. Ethical, Privacy and Safety Concerns

The identified key issues are data privacy, loss of human contact, diagnostic accuracy, and Potential abuse of information. The highest concerns were the inability to be humanistic 55.4% and the data. In this regard, privacy concerns, emotional comfort, and information security are the prime issues most of the users value the most: 54.5%. There were also comments about the fears of misdiagnosis and the limitations of algorithms. These observations chime together in the global discussion on responsible AI integration by underlining how building and, secondly, the need for robust data governance, strong security measures, and ethical frameworks win and retain the public's confidence.

E. Willingness to Recommend AI-Enabled Telemedicine

The researched respondents were dominated by conditional acceptance in being willing to recommend AI-integrated, out of the response options provided for telemedicine, with 44.6% selecting "Depends." Only 32.7% were fully supportive, while 22.8% were not willing to recommend such services. This trend therefore, points to the fact that customers expect proven services with a view to accuracy, rigorous privacy safeguards, and active clinician involvement before endorsement of AI-powered platforms. The results reinforce the advantages of the hybrid care model in which AI assists but it will no way replace health professionals.

IX. CONCLUSION

Artificial Intelligence in relation to telemedicine - the axis to complete the cycle of evolution in modern health care. It offers diagnosis with greater accuracy, accessibility, and efficiency in the domain of care delivery. Scrutiny and research were conducted on the facilitation of awareness and understanding of the benefits of the use of, as well as the concerns

related to, the use of AI-based telemedicine service by the general public, as per the survey conducted on the subject with the involvement of 101 respondents. The service and the significance of the AI-based telemedicine service were established. However, the study results have shown that even though the awareness of AI in the health industry has increased in recent times, the application of AI in the whole sector is quite low. This means that with increased awareness about AI, there has to be the implementation of AI. This means that there has to be telemedicine service available with AI.

This reflects what society expects as a whole: transparency, accountability, and human oversight in AI-mediated healthcare. Ethical challenges include equity, explainability, and accountability for errors. This highlights the need for strong governance frameworks. This shows what society as a whole demands in relation to transparency, accountability, and humanity in AI-based healthcare. Ethical challenges relate to equity, explainability, and accountability in the event of errors. This leads to the question of effective governance.

This, therefore, implies that the potential of the use of AI in telemedicine, as well as the limitations, has already been shown through the above study. The acceptance of the use of AI, however, will be dependent on the accuracy of the systems, the security of the systems, and the involvement of medical professionals. This, therefore, implies that the system needs to be able to meet the needs of the users and to adopt a patient-centered approach that is not only effective and ethical in development. The above-populated issues have been the basis of

development of the use of AI in the telemedicine sector, considering the two most important concerns raised. The above discussion focuses on a very important topic and raises the most discussed issue within the health sector.

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