

# Next-Gen Patient Support: AI Chatbots in Healthcare

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**Abstract:** *Integrating Healthcare with Artificial Intelligence (AI) has laid the foundation for innovative solutions that improve patient support and care efficiency. With smart chats and healing conversations, AI chatbots are revolutionizing patient care and engagement to improve health outcomes. From transforming queries to care, virtual health assistants are changing the Healthcare industry in an unimaginable way. AI chatbots are bridging the gap to better patient care and are now seen as the next-generation health system for better patient health. With the healthcare industry facing shortages concerning healthcare professionals, rising demand for health services, and financial pressures, artificial intelligence-based chatbots can contribute to better patient health outcomes and save time. Chatbots that use natural language processing (NLP) can help reduce the average time spent to reduce healthcare costs by 20%, according to a study by the IBM Institute for Business Value study [1]. This paper will review various AI-based chatbots available in the market, exploring their use cases, as well as their benefits and limitations.*

**Keywords:** Artificial Intelligence, chatbots, AI assistants, AI bots, healthcare bots, virtual assistants

## 1. Introduction

AI chatbots or AI assistants are gaining importance in the recent times due to their ability to improve patient care, enhance operational efficiency and reduce overall Healthcare cost. By leveraging Natural Language processing (NLP) and machine learning algorithms to interact with the patient and the provider, chatbots can help to manage overall healthcare workflows and to help medical professionals in taking better health decisions. With their ability to engage patients in real-time, AI has emerged as a transformation tool in the field of digital communication to assist from customer service to serving as personal assistants. AI bots can help improve efficiency and accessibility by automating messages and providing instant support. They can help answer medical queries, schedule appointments and remind patients to take medication. As health organizations face a lot of challenges with respect to staffing, increase in patient volumes and the rising cost, AI chatbots can play an important role in better managing these issues.

## 2. Use of AI chatbots in the Healthcare Industry:

- **Patient Care** - AI bots can help with symptom evaluation by providing an initial assessment of the symptoms. These bots require patients to enter the symptoms, and they can suggest possible conditions and provide future medical advice. They can also provide more information about the medical condition, treatment options, medications and lifestyle changes. They can further answer questions about common ailments and preventive health measures, reducing the need for human intervention for basic queries.
- **Appointment Scheduling and Reminders** – AI powered bots can integrate with hospital and clinical management systems to help patient schedule or reschedule appointments. They can also check for availability and suggest optimal times. They can also send reminders about upcoming appointments,

vaccinations, medication doses, and health checkups, helping to reduce missed appointments and ensuring better treatment adherence.

- **Mental Health counselling** - Mental health apps use AI to offer conversational therapy, cognitive behavioral therapy (CBT), and emotional support. These chatbots can guide users through coping mechanisms for stress, anxiety, and depression, providing continuous care between visits to a therapist. Few AI chatbots are designed to provide immediate emotional support, creating a safe space for individuals to express their feelings.
- **Chronic Disease Management** - There are many mental health apps in the market that use AI to offer conversational therapy, cognitive behavioral therapy (CBT), and emotional support. These chatbots can guide users on mechanisms to cope up with stress, anxiety, and depression, providing continuous care between visits to a therapist.
- **Data collection and Integration:** AI Chatbots can help automate patient data collection including medical history records, family history, medications, allergies, and lifestyle factors. The collected data can be integrated with Electronic Health records there-by providing a structured format of data collected making it easily for the health professionals to access data and not miss information that might otherwise be buried in big paragraphs. After treatment, chatbots can follow up with patients, asking about their recovery process or any side effects, helping doctors monitor progress.
- **Prescription Management** - AI chatbots can help patients remember when to take their medication, improving adherence rates, especially for those with complex regimens. Chat bots can provide detailed information about prescribed medications, such as potential side effects, interactions, and proper usage.
- **Healthcare Research and Data Analytics:** Chatbots can help match patients with appropriate clinical trials by gathering relevant health information and checking trial eligibility. AI chatbots can aggregate patient data to

Volume 13 Issue 11, November 2024

Fully Refereed | Open Access | Double Blind Peer Reviewed Journal

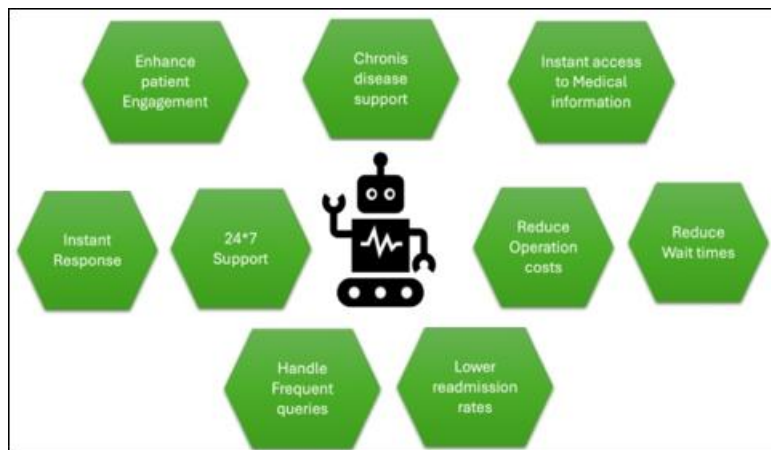
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identify trends and potential health risks, assisting healthcare organizations in research and population health management.

### 3. Benefits of AI chatbots in healthcare:

AI chatbots provide 24\*7 support allowing patients to get instant help for the information they need and not having to wait to talk to a Healthcare professional. They can enhance the patient journey by providing instant responses, reducing waiting times, and delivering consistent and reliable

information. With their capability to handle a large volume of patients parallelly, chatbots can be suitable for both small clinics and larger healthcare facilities reducing the need for live agents. They can reduce administrative and operational costs by automating routine tasks. Chatbots can handle routine tasks and repetitive questions, allowing healthcare professionals to focus more on needed critical care. They can also help schedule appointments and manage appointments by giving the patient flexibility to schedule, reschedule or cancel appointments without any kind of human intervention.



**Figure 1:** Benefits of AI chatbots for healthcare

#### Leading AI chatbots for healthcare:

There are over 35,000 health-related mobile apps available, and when individuals experience symptoms, their first instinct is often to search for information online [2]. With the rapid emergence of AI chatbots and virtual assistants, this study aims to review some of the most widely used and effective AI-driven tools that are revolutionizing patient care.

#### 3.1 Ada Health:

Ada is an AI powered symptom assessment tool that is developed and optimized by clinicians. With over 14 million users and 34 million symptom assessments done, Ada seems to be the most popular symptom assessment app in the market.[3]. Ada's chatbot is built on a rich medical knowledge base which includes information from clinical guidelines, scientific research and expert opinions. This helps to ensure that the recommendations provided are based on evidence-based approach. Ada chatbots uses machine learning algorithms that continuously improve as more users interact with the chatbot and Natural Language processing (NLP) to interpret user inputs provided in natural language. Below are some of the key points about Ada Health.

- The core feature of Ada Health is its ability to analyze symptoms. Ada can help analyze the symptoms and provide a list of possible conditions based on its knowledge base. The chatbot uses a step-by-step process allowing users to input the symptoms, allow follow-up questions to clarify the symptoms and use patient medical history to refine the analysis.
- Apart from the symptoms, Ada chatbots also considers other factors including age, sex, medical history and

lifestyle ensuring that the user is provided with a personalized health insight that is unique to his profile.

- Based on the assessment made, Ada provides recommendations on the next steps including self-care measures, if the person needs to see a doctor now or when based on the symptoms and details about potential diagnosis. Ada is designed and maintained by healthcare professionals and doctors thereby ensuring reliability and accuracy.
- For people having chronic health issues, Ada can monitor ongoing symptoms and provide trends over time and adjust care plans if necessary.
- Ada emphasizes on the importance of data security and privacy. All PHI (Personal Health Information (PHI) entered in the app is stored securely and in compliance with privacy regulations like the General Data Protection Regulation (GDPR) in the EU.[5]
- The app is available in multiple languages, user friendly and custom pricing available.

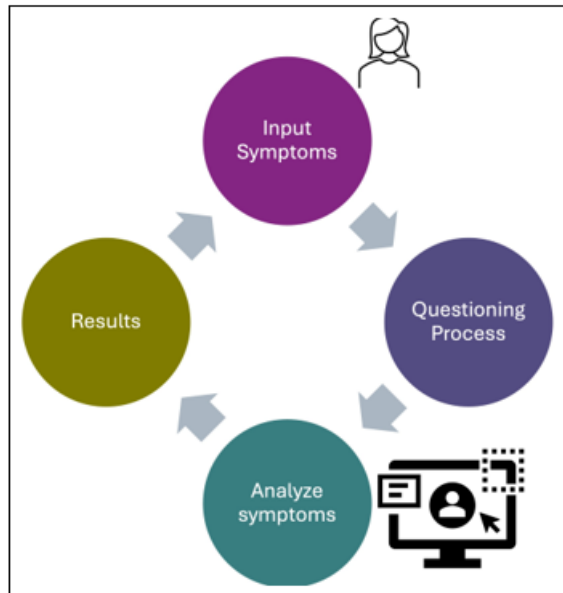


Figure 2: Ada Process flow

### 3.2 Babylon Health

Babylon Health is a digital healthcare platform that provides users with access to medical consultations, health information and prescriptions through a mobile app. It uses artificial intelligence-based algorithms to assess symptoms provided by users, do an initial analysis of the symptoms and connect patients with doctors through virtual appointments. Its machine learning capability helps to continuously improve based on the interaction with users. To understand and respond to user queries, Babylon's chatbot relies on Natural language Processing (NLP) which enables it to interpret user input in plain language and respond in a conversational manner. This feature of Babylon makes healthcare more accessible and affordable and providing 24/7 access to doctors virtually. Below are some key points about Babylon Health.

- Babylon's chatbots allows users to input symptoms they are experiencing. With a combination of Ai and evidence based medical algorithms, the systems generate possible diagnosis and suggests appropriate next steps such as self-care or over the counter medication or referral to a healthcare professional.
- The chatbot is available 24\*7 thereby providing immediate access to medical advice for users who do not have any urgent questions or concerns. This can help users understand their symptoms before deciding about whether to visit a doctor or not.
- In few regions, Babylon offers the ability to connect users with healthcare professionals via video consultation. The chatbot can triage patients, gather basic information and schedule these consultations.
- The chatbot can help users track sleep, physical activity, diet and medication. It can use this data to provide recommendations to improve overall user health.
- The chatbot can offer personalized advice by integrating personal health data, user lifestyle and medical history, the chatbot can offer personalized advice. This could range from reminders to medication to lifestyle changes to promote better health.

- The chatbot can also provide information about prescribed medications, their uses and potential side effects.
- Few versions of Babylon's chatbot provide mental health support offering coping strategies, mindfulness exercise or referring the users to a licensed mental health specialist.
- Babylon has partnered with few Health organizations where the chatbots can pull of relevant health history of the user and offer more informed advice [6].
- This app is best known for its triage options and allows custom pricing [5].

### 3.3 WOEBOT

Woebot is a digital mental health bot that uses artificial intelligence to provide users with support and guidance for managing emotions and mental well-being. A lot of people experiencing depression or anxiety or any sudden moment of crisis often find it difficult or hesitant to call a doctor or a health professional. They often wonder on who to call, which therapist would be able to help them best, how long they must wait or how much it will cost [7]. Though Woebot cannot be a substitute for a professional substitute, it is a helpful option for those looking to go through daily stress, anxiety or emotional challenges. It provides a combination of structured exercises, emotional check-ins and psychoeducation in a user-friendly manner. Below are some key points about Woebot

- Woebot is often called a "conversation assistant" as it interacts based on a text-based approach, more like chatting with a friend. By asking questions and listening to users' response, the bot can provide guidance based on what the user is going through.
- It uses Cognitive-Behavioral Therapy (CBT) which is a proven therapeutic method for managing stress, anxiety and depression. CBT allows you to identify negative thoughts or patterns and replace them with healthier and balanced ways of thinking.
- The bots ensure to make a daily check-in to see how the user is feeling to track the user's mood over time and spot any recurring patterns or triggers for stress.
- It offers Psychoeducation content explaining concepts like mindfulness, thought reframing and emotional regulation which can help you better understand your feelings and reactions.
- It provides personalized guidance to suit the user's needs. Example if the user is suffering from stress or anxiety, woebot can guide through relaxation techniques or helps you break down negative thoughts into more manageable ones.
- Woebot is available 24\*7, so it is convenient if you are looking for an on-demand emotional support [8].
- This chatbot is best known for effectively using Large Language models (LLM) and its pricing starts from \$30-\$40 per month.

### 3.4 Wysa Chatbots

WYSA is another AI-driven mental health tool which is like Woebot but with a focus on emotional well-being and selfcare. It's a chatbot designed to offer users, mental health

support through conversation, utilizing psychological frameworks such as CBT, Dialectical Behavioral Therapy (DBT) and mindfulness to help manage stress, anxiety, depression, and other mental health challenges [9]. Below are some key points of Wysa.

- Like Woebot, Wysa also operates through text-based chats where the user can talk about how he/she is feeling, and it provides response to help the user navigate through emotions and challenges. It uses natural language processing to understand the users concerns and provide relevant support.
- Wysa integrates evidence based psychological techniques including CBT which helps the user recognize and challenge unhelpful thought patterns, mindfulness which offers relaxation and grounding exercises to help reduce stress, DBT a technique that emphasizes emotional regulation and building coping skills and positive psychology that focuses on strengthening resilience and well-being.
- Wysa can help the users track their mood and emotional patterns over time. By checking in regularly, it provides insights into your emotional health and helps identify triggers.
- Wysa provides interactive tools and exercises such as journaling prompts, breathing exercises, thought reframing tasks and gratitude exercises.
- The chat assistant is designed to ensure that all the user's conversations are confidential and anonymous giving the users a safe space to open without any fear of judgement.
- The more the users use this tool, it becomes better at understanding your needs and offer tailored advice based on the users emotional state [10].
- Wysa provides both free and custom pricing based on the service offered [11].

### 3.5 Your.MD

Your.MD is an AI-powered health chatbot designed to provide users with personalized medical health information, and symptom check. It's a digital assistant that helps people understand their symptoms, offering potential diagnosis and recommendations for next steps in their healthcare journey. Your.MD is a great example where AI can be used to improve access to healthcare information and support, especially in situations where people may not have immediate access to a doctor. Below are some key points relating to Your.MD [12].

- The chatbots asks the users a series of questions about your symptoms, medical history and lifestyle. Based on the answers provided by the users, it generates a list of possible condition or illness that might be causing the symptoms. By using evidence-based algorithm, it suggests the most likely diagnosis and provide relevant advice.
- Your.MD doesn't just give a diagnosis, it provides tailored advice on what the users can do next which could be suggesting on the counter medicine, lifestyle changes, or in more serious condition, recommend seeing a healthcare professional.
- The chat assistant provides a wide range of trusted health information, allowing users to learn about specific conditions, treatments, medications, and prevention methods.

- Users can track symptoms, medications and progress over time which can help monitor conditions or improve conversations with healthcare provider.
- In some regions, Your.MD integrates with local healthcare services to make it easier for users to book appointments or access further care if necessary.
- This app is available 24\*7 like all the other chatbots and ensures Data security and Privacy is in regulation with compliance.[13]

## 4. Limitations and Challenges of AI Chatbots

AI chatbots are increasingly being used in healthcare to provide convenient, 24\*7 access to medical advice, symptom checking, and general wellness support. However, there are several limitations and challenges associated with their use, particularly in a sector as critical as healthcare. These challenges need to be addressed to ensure that AI chatbots can be both safe and effective tools for patient care.

### 4.1 Accuracy and Reliability

While AI chatbots can analyze symptoms and offer advice based on data, they are still not 100% accurate at diagnosing medical conditions. Their capability to diagnose are dependent on the data they are trained on and there might be a risk that the chatbot may not recognize rare or complex conditions, leading to inaccurate or incomplete diagnosis. AI models are only as good as the data they are trained on is therefore important to ensure that the data used for training is complete and accurate. If the data includes bias or errors, the chatbot may provide leading misleading or harmful advice. For example, it could suggest treatments that are not appropriate for specific individuals due to variations in age, sex, medical history or other factors.[14]

### 4.2 Lack of Human Empathy and Judgement

AI chatbots can't fully understand or respond to the emotional nuances of a conversation. Healthcare often requires a level of emotional support and empathy that an AI chatbot often cannot provide. A human doctor can offer reassurance, comfort and compassionate care, qualities that AI might lack. Few health-related issues like mental health, chronic illness or serious diagnosis requires refined judgement and understanding that goes beyond a chatbots capabilities. A chatbot can provide regular advice but may fail to offer emotional sensitivity needed in some cases.

### 4.3 Security and Privacy concerns

Healthcare care data is highly sensitive and data security and privacy is a major concern. AI chatbots often collect large amounts of personal health data, which if mishandled can lead to privacy concerns. Even with encryption and regulatory compliance, there is always a risk that hackers could access or misuse sensitive information. Different countries have different data protection laws and adhering to these laws becomes very important. Ensuring trust while maintaining users trust is an ongoing challenge. AI platforms may not have the necessary infrastructure to meet these regulatory requirements, leading to potential legal issues.



#### 4.4 Limited scope of care

Most AI chatbots are designed to provide general advice and are not capable of addressing more complex or serious health issues. While they can be helpful for triaging symptoms or offering general health advice, they cannot replace the depth of care provided by a qualified health professional. In cases of emergencies, AI chatbots may not be able to provide immediate, life-saving interventions. They may advise users to seek medical attention, but they cannot directly assist in emergency care or decision making. Though AI chatbots can help with simple lifestyle recommendations, they may not have the sophisticated capabilities required to manage chronic disease or long-term health conditions where regular monitoring and tailored care plans are essential.

#### 4.5 User Trust and Adoption

Not all patients may be comfortable using AI for healthcare advice, particularly when it is something as important as one's health. The lack of human might cause a sense of mistrust especially if there are any errors made by the chatbot or makes a decision that does not align with the patients' expectations or understanding. If users feel that the chatbot is not providing correct advice, they might abandon the tool reducing its effectiveness and potential for widespread use. Misleading or incomplete answers can also lead to patients taking the wrong actions, which could have harmful consequences.

### 5. Recommendations

In this paper, we reviewed few widely used AI chatbots in the markets, their ability to improve Healthcare and we also discussed about the limitations and challenges of using AI based chatbots to make health decisions. To maximize the potential of AI chatbots in healthcare while addressing their limitations, let's look at few recommendations that can help improve their performance, user engagement and integration within the Healthcare ecosystem. AI Chatbots in healthcare need access to diverse and high-quality medical data. This includes not only common conditions but also rare diseases, diverse demographics and up-to-date clinical guidelines. It is important to regularly update the data used for training to ensure the chatbot results and predictions are accurate. AI chatbots should be developed in collaboration with healthcare professionals to ensure that the chatbots response aligns with current medical practices and guidelines. Regular audits and of the chatbots recommendations by medical professionals can help identify and correct any inaccuracies or gaps in the system. Chatbots should be built on robust, evidence based medical frameworks and continuously updated to reflect new medical research. This will ensure that the advice provided is grounded in scientific facts and best practices. AI chatbots should be able to provide more personalized recommendations based on individual health history, lifestyle factors, and preferences. Personalization helps the chatbot deliver more relevant advice and create a more engaging, tailored experience for users. Health-related information can be complex, so AI chatbots should communicate in clear, simple language. Avoiding complex medical terms and offering easy-to-understand explanations

of conditions, medications, and treatments will help increase user engagement, especially for patients with lower health literacy. AI chatbots should include mechanisms for referral or escalation to human healthcare professionals when complex issues or high-risk symptoms are identified. This includes appointment scheduling and referring to specialists. AI chatbots should be regularly tested and audited to identify and mitigate any biases, particularly related to gender, age, race, or socio-economic status. Bias in training data can lead to inaccurate or inequitable healthcare recommendations, so diverse, representative data must be used to train AI systems. While AI chatbots can handle common symptoms, they should be able to detect more complex or rare conditions through advanced symptom analysis and machine learning techniques. Building trust in AI chatbots takes time. Offering consistent, accurate, and empathetic responses is key to earning users' trust. Additionally, transparency about the chatbot's capabilities and limitations, as well as ethical practices, will enhance long-term user confidence.[15][16]

### 6. Conclusion

AI chatbots have made significant improvement in transforming the healthcare sector by providing a wide range of support from patient triage to mental health to chronic disease management. The AI driven tools have shown the potential to improve patient care and engagement, streamline administrative tasks, reduce healthcare costs and even enhance the accuracy of diagnosis made. By providing timely, accessible information and support, chatbots can help bridge gaps in healthcare access, especially in underserved or resource-limited areas. Though AI chatbots have the potential to transform healthcare by providing accessible, efficient, and personalized services, it is important to address challenges relating to privacy, accuracy, trust and ethical concerns. By continuing to innovate, collaborate with healthcare experts, and prioritize patient-centered solutions, AI chatbots can become a valuable tool in improving health outcomes worldwide.

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