



Usability of Voice Assistants in Healthcare: A Systematic Literature Review

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Abstract. Over the last decades, the rapid development and applications of voice assistants (VA) have been integrated into healthcare systems worldwide. With the high acceptance rate of voice assistants, usability is the key aspect that must be examined to ensure effective and accurate performance in the critical and sensitive environment of healthcare. Based on our research, not many studies reviewed the usability of voice assistants in healthcare and thus creating a notable gap in the literature regarding the usage of VA in healthcare. This study presents a qualitative systematic review of the usability of VA in healthcare with a breakdown of five major categories where VAs serve in healthcare. A total of 18 papers contained supportive evidence for the review and summarizes the roles and usages of VA in healthcare along with existing applications in healthcare systems. Based on the reviewed studies, limitations of VA and recommendations for future research to ensure effective and reliable applications of VA in healthcare are reported.

Keywords: Voice Assistant · Healthcare · Systematic Review

1 Introduction

In today's era of rapid technological advancement and artificial intelligence, the interactive voice assistant (VA) has emerged as a critical application of AI technology [28]. Integrated into voice-controlled devices and smartphones, VA utilizes natural language processing, speech synthesis, and voice recognition to understand and execute human commands [30]. With its ability to provide prompt and purposeful responses, VA enables users to complete tasks hands-free and save valuable time [14]. Its widespread adoption is evident, with 27% of the global population using voice assistants for mobile searches [1] and approximately 41% of Americans relying on VA for multiple daily searches [4]. Acting as a bridge between human-computer interaction, VA enhances convenience, reduces multi-tasking, and maximizes time efficiency, making it an essential tool in our daily lives [30].

Supported by Kennesaw State University.

Users have enthusiastically embraced voice assistants, finding them both useful and enjoyable for their ability to engage in human-like emotional conversations, allowing users to express their social identity in the digital world [5]. Voice assistants have been adopted across various domains, serving the primary purpose of simplifying people's lives, as implied by their name. Regardless of age, ethnicity, or social class, voice assistants are utilized by a diverse group of consumers for a wide range of tasks. The most common functionality of voice assistants is conducting searches through voice commands [10]. Additionally, they perform other everyday tasks such as playing music, setting reminders, sending text messages, making calls, and controlling smart home automation systems through voice-integrated IoT devices [30].

Voice assistants go beyond being mere day-to-day assistants; they have found application in more complex settings, including education, business, and healthcare. In the education sector, teachers employ voice assistants to streamline their sessions, tracking attendance, monitoring students' performance, and providing instant and accurate answers to queries [30]. In the business realm, voice assistants serve as alternatives for customer agents, enhancing customer interactions on business websites through voice chatbot systems. These systems assist customers with support, online ordering, and product recommendations, while also enabling transactions and scheduling meetings to minimize multitasking and eliminate human error [14]. Moreover, voice assistants play a crucial role in the healthcare system, benefiting both patients and practitioners. They assist patients in their daily lives, manage mood disorders, aid in disease treatments, provide consultations, and support Covid-19 care [18]. Additionally, voice assistants help healthcare professionals optimize their workflow and efficiency within healthcare units [20]. Given the critical nature of healthcare, which involves human lives, privacy, and overall safety, the usability and efficacy of voice assistants in this context have garnered significant attention. While systematic reviews exist on topics such as voice assistants' usability [9], their applications in chronic conditions [6], and their interaction with an aging population [23], there remains a notable gap in the literature regarding the specific roles and usages of voice assistants in healthcare. This paper aims to bridge this gap by conducting a comprehensive systematic review of voice assistants in healthcare. The review seeks to summarize the diverse applications of voice assistants in healthcare settings and address research questions concerning the quality and effectiveness of voice assistants in improving healthcare outcomes.

Section 2 presents the methodology, including the research questions, search strategy, eligibility criteria, paper selection, quality assessment, data extraction and synthesis. This is followed by Sect. 3, which presents the breakdown of categories of the individual studies, descriptions of included papers, analysis, and details of each category, different usages of VA in healthcare, and the applications of VA. Section 4 presents the discussion and Sect. 5.

2 Methods

2.1 Research Questions

This systematic review aims to comprehensively examine the utilization of voice assistants in diverse healthcare settings and synthesize the available evidence on their efficacy and impact in healthcare contexts. To structure our research questions effectively, we employed the PICO (Population, Intervention, Comparison, Outcome) framework, a widely recognized criterion for formulating research questions in systematic review studies across various disciplines, including psychology, education, primary care, and software engineering [13]. The utilization of the PICO framework ensured the formulation of precise and comprehensive research questions that guided every aspect of our systematic review process, including the development of search strategies, quality assessment protocols, and data extraction procedures. By adhering to the PICO framework, we established specific criteria based on our research interests as outlined below:

- The **population** of people who work and use the healthcare system, e.g. patients, healthcare professionals, caregivers.
- The **intervention** of voice assistant.
- In **comparison** to no assistance from the voice assistant or voice-controlled devices.
- The **outcome** of changes in the targeted population and their quality of life.

We defined our research questions as the following:

- RQ1–What roles and types of voice assistants exist in healthcare?
- RQ2–How effective is voice assistant versus the absence of voice assistant for improving the quality of life of people involved in healthcare?
- RQ3–How has the use of voice assistants impacted and supported individuals in the healthcare system? What evidence exists to support these claims?

2.2 Search Strategy

In order to explore the intersection of voice assistants and healthcare, our study utilized extensive scientific databases such as Scopus and IEEE Xplore. Given the vastness of these databases and the broad scope of our research topic, which encompasses technology, health, and various aspects related to voice assistants, we employed a consistent search strategy across both databases. Our search string consisted of two keywords, ‘voice assistant’ and ‘healthcare’, connected by the operator ‘AND’. This final search string, “voice assistant” AND “healthcare”, was applied to titles, abstracts, and keywords of the studies.

After completing the search process, a total of 136 studies were identified, with 98 studies sourced from Scopus and 38 studies from IEEE Xplore. To facilitate further review and filtering, the data from both sources was exported and consolidated into a single Excel file.

2.3 Eligibility Criteria

In order to prevent bias and have direct evidence for the established research questions, we created the eligibility criteria—inclusion and exclusion criteria—in our protocol. We applied a set of exclusion criteria and excluded papers with at least one criterion presented to narrow down the final number of relevant papers. Papers that were qualified for further screening were the ones that matched all of the inclusion criteria. An overview of the eligibility criteria is shown in Table 1. These criteria are listed in Table 1, which include (i) duplicated papers; (ii) full-text availability; (iii) related papers to the study.

Table 1. Inclusion and Exclusion Criteria for Primary Studies

Conditions for Inclusion	Conditions for Exclusion
* The study must contain information about voice assistants and any healthcare application	* Studies focusing on other topics that do not include these keywords and are not related to healthcare
* Paper is not a duplicate existing in a different database	* Paper is already included. Copy exists in a different database
* Original research relevant to the topic in question	* Similar studies or reviews in multiple scientific databases
* Paper is written in English	* Paper is not written in English
* Peer-reviewed papers published in a conference proceeding or journal	* Non peer-reviewed papers or published in predatory venues
* Studies that are open access, i.e., have the full text available	* Studies that do not have full text available

2.4 Paper Selection

After conducting the initial search, the set of 136 studies underwent screening based on the eligibility criteria to determine the total number of papers included and excluded for further review. In the first round of screening, 13 duplicated papers were identified and removed from the set. In the second round, papers with unclear or irrelevant abstracts to the study's topic were excluded, resulting in the elimination of an additional 81 papers. The remaining 42 papers from the search process entered the third round of screening, where the eligibility criteria were applied during full-text analysis. Initially, 10 papers were removed in the first phase of this round due to the unavailability of full access to the selected databases (Scopus and IEEE Xplore) or in other libraries, despite an extensive search. Ultimately, after completing Round 3, 14 more papers were excluded, leaving 18 papers eligible for data extraction and final review. A concise overview of the paper selection process is visualized in the PRISMA flow diagram, depicted in Fig. 1.

2.5 Data Extraction and Synthesis

To address the research questions, relevant data were extracted from the 18 included papers through a meticulous data extraction process. A template

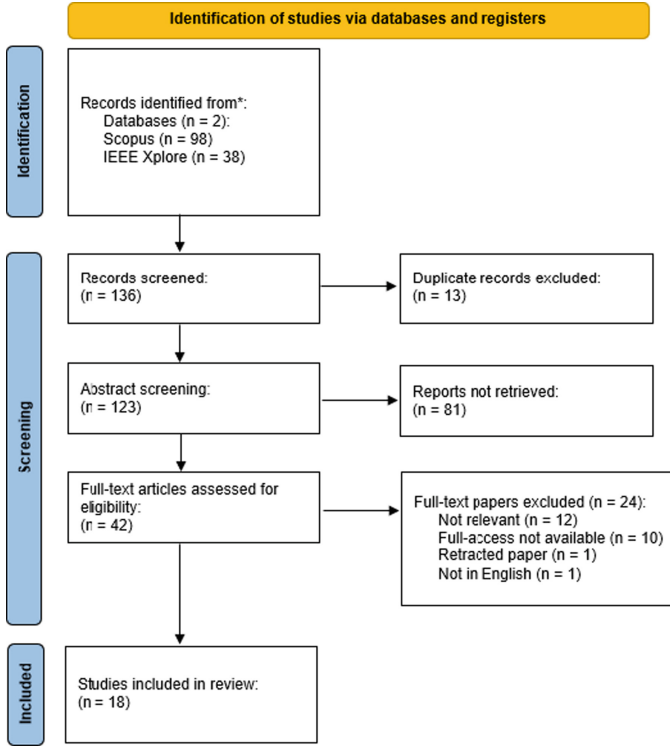


Fig. 1. PRISMA flow diagram of the selection process and final result.

(Table 2) was developed, outlining the specific items required for the review, and a spreadsheet was utilized to organize and record the extracted data. Each data item corresponded to the responses related to either the research questions or the quality assessment.

Following the data extraction phase, we employed a qualitative synthesis process, as recommended by the Cochrane Handbook for Systematic Reviews of Interventions [13]. This involved a thorough examination and analysis of the extracted data to ensure objectivity and ensure a comprehensive body of evidence for the research questions. Additionally, we investigated the connections between studies conducted in various healthcare settings and grouped similar studies into relevant categories. These categories, which will be further discussed in the Results section, are presented in Table 3, displaying the five distinct healthcare areas along with the number of papers assigned to each category.

3 Results

In this section, we provide answers to our research questions by carefully analyzing and categorizing the 18 papers that were extracted during our review process.

Table 2. Data Extraction Template

	Items	Descriptions	Category
Paper	Study Number	Keep track of papers in each category and use later in Results section. Abbreviated by S_n (for n is the number of papers)	RQ1, Study Overview
	Title	Names of the included papers	Study Overview
	Country of Study	Keep track of the origin of the papers	Study Overview
Characteristics of included studies	Aim of Study	Concisely summarize the focus of the study	Study Overview
	Roles of VA	What voice assistants serve in the study	RQ1
	Types of VA	Name of voice assistant used in the study	RQ1
	Effectiveness of VA	Data on the usability, accuracy, impact, and quality of VA	RQ2
	Evidence	Applications or innovations in the studies	RQ3
Participants	Population	Types of people use VA in each study	RQ1, RQ2, RQ3, Study Overview
	Area in Healthcare	Area where VA is integrated in	RQ1, RQ2, RQ3

Table 3. Number of paper for each category

Category	Number of papers (n)
Patient Care	7
COVID-19	2
Mood Disorder Management	3
Hospital Operation	4
Disease Management	2
Total	18

3.1 RQ1: What Roles and Types of Voice Assistants Exist in Healthcare?

Among the 18 papers included in our analysis, 7 papers (38.8%) exclusively utilized Amazon Alexa as their voice assistant, while 7 papers (38.8%) did not specify a particular voice assistant. Furthermore, 3 papers (16.6%) employed multiple voice assistants or included all types available, and 1 paper (5.5%) developed its own voice assistant specifically for the study.

The healthcare system comprises numerous sectors and areas, as supported by sources. Consequently, the roles of voice assistants vary depending on the specific healthcare areas. However, there are overlapping functionalities of voice assistants across multiple areas. In this study, we identified and categorized the roles of voice assistants in five distinct areas based on the findings of relevant studies. Specifically, the roles were discussed in seven studies related to Patient Care (n = 7, [7, 8, 11, 12, 22, 24–26]), two studies in COVID-19 (n = 2, [15, 20]), three studies in Mood Disorder Management (n = 3, [16, 17, 21]), four studies in Hospital Operation (n = 4, [3, 18–20]), and two studies in Disease Management (n = 2, [2, 29]). For detailed information on the roles of voice assistants, please refer to the respective sub-sections within each category.

Patient Care. Voice assistants play a pivotal role in assisting end-users, as supported by factual evidence. Consequently, the area of Patient Care emerged as the primary focus where voice assistants served a wide range of populations. Notably, voice assistants provided valuable support to patients, including elderly patients [7, 8, 11, 22, 24, 26], caregivers of children with special healthcare needs [25], and disabled individuals [12]. An example is shown in Fig. 2.

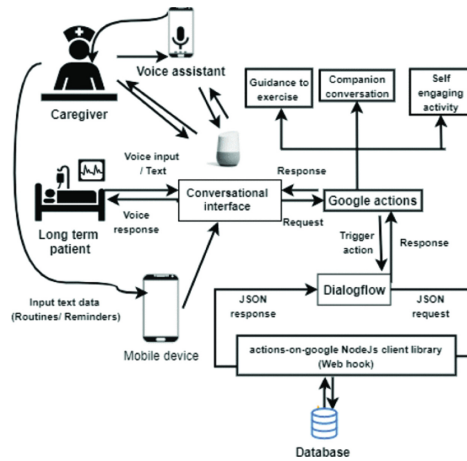


Fig. 2. System Architecture of Voice Assistant in Patient Care [11]

COVID-19. During the critical period of the global COVID-19 pandemic, healthcare professionals dedicated their time and expertise to closely support patients, prioritizing their care amidst the demanding circumstances. Technological advancements played a significant role in monitoring patients’ health, with the assistance of various devices. In this context, voice assistants emerged as valuable tools, offering guidance and information specifically related to COVID-19.

Furthermore, voice assistants provided feedback to patients by analyzing essential health indicators such as body temperature, heart rate, and oxygen levels, thereby assisting in the assessment of the likelihood of a COVID-19 infection [15,20].

Mood Disorder Management. Among the 18 studies examined, three studies [16,21] shed light on the roles of voice assistants in supporting patients with mood disorders, including mild to moderate depression, anxiety, and pre-diagnostic depression. Notably, a study conducted in Singapore [17] highlighted the use of a voice assistant to provide information resources related to eating disorders and co-existing depression. In two distinct studies, Amazon Alexa was employed with different purposes: as a monitoring tool and pre-diagnostic depression detector [21], and as a problem-solving treatment coach [16]. In the case of a pre-diagnostic depression study, Alexa closely monitored patients' depressive symptoms, analyzing changes in their vocal tones [21]. This information enabled the voice assistant to provide a pre-diagnosis of depression, aiding healthcare professionals in identifying patient symptoms from their homes [21].

Hospital Operation. Within the hospital setting, voice assistants played a diverse range of roles, catering to various user groups and serving distinct purposes. In hospital triage operations, voice assistants assumed the role of front-line workers, providing assistance to patients in the emergency room. They would initially inquire about standard information, including main symptoms, body temperature, full name, and pain evaluation. Based on the collected information, the voice assistant would then assign patients a priority level [20]. Subsequently, the voice assistant would transmit the recorded data to the relevant agent and request human assistance if necessary.

Voice assistants serve various administrative purposes in healthcare settings, benefiting both patients and staff [18]. Patients can conveniently control devices, such as TVs, using voice commands directed at the voice assistant [18]. They can also rely on voice assistants to assist with tasks such as placing meal orders, calling their nurse, obtaining information, entertainment, setting reminders, and even during emergency situations [18,19]. This functionality allows nursing staff to allocate their time more efficiently towards core responsibilities [18].

Voice assistants also play a vital role in supporting hospital staff and healthcare professionals in managing electronic health records (EHRs). They can help schedule appointments, add notes, retrieve the nearest available appointments, order lab tests, and provide access to essential patient information [3]. A noteworthy example cited in [18] involved a pilot program implemented at the Boston Children's Hospital, where voice assistants were utilized to streamline pre-operative organ validation and handle administrative tasks in the intensive care unit [18,27].

Disease Management. Voice assistants were employed in studies focused on Multiple Myeloma (MM) disease and Alzheimer's disease and related dementia.

Amazon Alexa was utilized to provide medical term explanations, connect users to support groups, and offer a quiz feature specific to MM disease [2]. Additionally, Alexa extended its support to caregivers of individuals with Alzheimer's Disease and related dementia by providing explanations about food items and nutrition, suggesting meals and recipes, and offering tips for maintaining a proper diet [29].

The references cited provide valuable insights to answer the research question regarding the roles and types of voice assistants in healthcare. These studies showcase the diverse functions performed by voice assistants across different healthcare domains. They highlight how voice assistants serve as front-line workers in hospital triage operations, aid patients in obtaining information, entertainment, and emergency assistance, support administrative tasks for patients and healthcare professionals, and even offer disease-specific functionalities such as medical term explanations and connections to support groups. Furthermore, the references shed light on the types of voice assistants utilized, including Amazon Alexa, which demonstrates the variety of voice assistant technologies employed in healthcare settings.

3.2 RQ2: How Effective is Voice Assistant Versus the Absence of Voice Assistant for Improving the Quality of Life of People Involved in Healthcare?

The evaluation of voice assistants' effectiveness in healthcare involved assessing their usability, accuracy, impact, and overall quality, as reflected in the selected studies. While it is important to acknowledge the existing limitations and challenges faced by voice assistants, including algorithmic and accuracy errors [17], the overall usage of voice assistants has demonstrated a positive impact on people's lives within healthcare settings. In this review, data extraction for RQ2 was based on the discussions from 15 out of the 18 papers, highlighting the extensive exploration of the impact of voice assistants. The usage and growth of voice assistants have shown significant effects on three key aspects: the quality of patient's life, the quality of the healthcare system, and the quality of the voice assistants themselves.

Quality of the Patient's Life. A total of 6 papers [8,11,12,18,21,24] highlighted the positive impacts and benefits brought about by voice assistants for patients and their caregivers. Voice assistants were found to offer a more comfortable interactive environment compared to mobile phones or other devices when seeking assistance [21]. They enabled patients, especially the elderly, to lead a more realistic and independent life within the comfort of their own homes [11,12]. In the case of home healthcare system, voice assistants served as symptom checkers and first-aid ambulances during emergency situations, while also managing patients' health records, thereby enabling independent living [8]. Voice assistants significantly improved the quality of life for patients, including those with physical or visual impairments, by providing faster, hands-free, and user-friendly ways to meet their needs and manage daily routines [18,24].

The positive impact of voice assistants was further supported by a survey conducted in long-term patient care, where 37.5% of the respondents acknowledged that voice assistants played a role in enhancing their independence. Additionally, 26.7% referred to voice assistants as friends or companions, and among the caregivers surveyed, 83.4% out of 16% stated that voice assistants were supportive in their caregiving tasks [11].

Quality of the Healthcare System. Voice assistants have made significant contributions to the healthcare system, particularly in enhancing productivity and streamlining processes within hospital triage. They assist healthcare staff in the emergency room and also serve patients for administrative purposes, resulting in improved workflow [20]. Moreover, voice assistants have been reported to offer a more cost-efficient solution for healthcare providers compared to traditional care facilities [7]. Acting as front-line assistants and personal aides, voice assistants have proven invaluable to healthcare professionals by facilitating efficient management of electronic health records, allowing them to focus solely on their core responsibilities and increasing productivity [19].

Quality of Voice Assistant. The reviewed applications of voice assistants presented in the selected papers demonstrate a meticulous evaluation process [2] and a continuous improvement in accuracy over the years [17,22]. These advancements aim to create a patient-friendly environment and enhance users' overall experience [22]. Although voice assistants may still encounter errors and failures in fully comprehending user commands and providing the most accurate responses, studies have consistently shown the ongoing development and provision of high-quality and accurate answers. For instance, a study revealed that Amazon Alexa and Apple Siri achieved an increase of approximately 10–24% in accurately recognizing medication names within just two years [22]. Furthermore, a study from the National University of Singapore highlighted that Cortana exhibited higher quality scores and accuracy compared to the performance of Google Search [17].

The references cited in this study provide valuable insights that contribute to answering the research question concerning the effectiveness of voice assistants compared to the absence of voice assistants in improving the quality of life for individuals involved in healthcare. These references shed light on the positive impact of voice assistants on patients, caregivers, and healthcare professionals. They demonstrate how voice assistants enhance the healthcare experience, increase independence, offer personalized support, streamline processes, and improve productivity. Despite some limitations and challenges faced by voice assistants, the evidence indicates their continuous development, accuracy improvements, and commitment to providing high-quality assistance. Overall, the referenced studies suggest that voice assistants have proven effective in enhancing the quality of life for people involved in healthcare, making them valuable tools for the healthcare ecosystem.

3.3 RQ3: What Evidence is There that Voice Assistants Have Been Used to Impact and Support People’s Lives in the Healthcare System?

10 papers presented the applications of voice assistants in multiple relevant categories and highlight the functionalities of voice-based devices in impacting people’s lives in the healthcare system. Among the 10 applications, 5 applications belong to Patient Care ($n = 5$, [7, 8, 12, 24, 25]), 2 applications in Hospital Operation ($n = 2$, [3, 20]), 1 application in Mood Disorder Management ($n = 1$, [16]), 1 application in COVID-19 ($n = 1$, [15]), and 1 application in Disease Management ($n = 1$, [2]). Table 4 reports the study reference, application name, type of voice assistants used, category, and description of each application.

4 Discussion

4.1 Study Limitations

In this systematic review, we conducted a thorough screening of 136 papers and identified 18 papers that presented qualitative evidence on the usability of voice assistants in healthcare. However, we acknowledge certain limitations in our approach. Firstly, our review relied on a limited number of databases to identify relevant studies, which may have constrained the breadth of our findings. To address this, we plan to expand our search to include additional databases in future studies. Secondly, we chose not to employ methods such as the snowball search or hand-searching, opting instead to focus on the database search strategy to obtain a comprehensive collection of articles spanning various aspects of healthcare. Nevertheless, we recognize that incorporating alternative search methods could provide valuable insights in future investigations. To ensure a comprehensive qualitative review of voice assistant usability, we recommend incorporating more assessments of user experience, as these technologies play an integral role in assisting individuals on a daily basis. While our review primarily focuses on the usability aspect, it provides an overview of the current state-of-the-art applications of voice assistants in healthcare and sets the stage for future research and advancements.

4.2 Challenges and Future of Voice Assistant in Healthcare

During the comprehensive process of full-text screening and data extraction, a notable observation emerged: the majority of studies investigated the challenges and limitations associated with voice assistants in healthcare, as well as the errors encountered by voice-based applications. Even though the first voice assistant was used in the early 1960s, the integration of voice assistants into people’s daily life became more common within just the past decade [14]. Therefore, various errors exist in VA’s algorithm design and comprehension level [17]. In the realm of EHR management, numerous studies have identified a significant

Table 4. Applications of Voice Assistants (Part I)

Study Ref.	Application Name	Type of VA	Category	Description
[15]	CovIoT	VA module developed within the application	COVID-19	An Arduino-based automatic hand sanitizer dispenser with integrated voice assistant and body monitoring feature.
[20]	Mycroft Skill for Hospital Triage	Mycroft	Hospital Operation	Using an open source voice assistant, Mycroft, to develop skills to manage hospital triage
[25]	SpeakHealth	Siri	Patient Care	A voice-enabled note-taking app for caregivers of children with special healthcare needs
[2]	Alexa Skill <i>Multitple Myeloma</i>	Alexa	Disease Management	Amazon Alexa voice assistant provides explanations for medical terms related to Multiple Myeloma disease, connections to support groups, and a quiz functionality.
[16]	Lumen	Alexa	Mood disorder management	A virtual voice-based coach and delivering 8 evidence-based and problem-solving sessions for patients with mood disorders.
[8]	Voice-enabled Healthcare System for Patients	Alexa and Google Assistant	Patient Care	A patient-focus voice application serves as a personal medical assistant and help patients with the monitoring of their body essential signs.
[7]	ACHO—Voice Assistant on Health and Care Offline	ACHO	Patient Care	A voice assistant facilitates treatment adherence among elderly adults in rural areas.
[12]	Voice Assistant and Touchscreen Operated Intelligent Wheelchair	Any commercial voice assistants	Patient Care	A voice assistant enabled wheelchair assists physically impaired people with ability to control without an active internet connection.
[3]	DocPal	Alexa	Hospital Operation	An EHR assistant in form of Amazon Alexa Skill assists health practitioners and complements the manual operation of EHR.
[24]	VoiceCare	VA module developed within the application	Patient Care	A wearable voice-interactive cognitive assistant on smartwatch for daily life healthcare

concern surrounding the storage and privacy of personal information and protected health information. These studies have shed light on the importance of addressing this issue to ensure the secure handling of sensitive data in healthcare settings [20]. At present, most commercial voice assistants have a strong possibility of not satisfying all of the requirements for the Health Insurance Portability and Accountability of 1996 (HIPAA) [19]. In addition, limitations exist in voice assistant applications based on the user's experience. Interacting with a voice assistant is not universally embraced, as some individuals may not find comfort in this mode of interaction. Furthermore, there are instances where people may actively avoid using voice assistants in public spaces due to feelings of embarrassment or shame [18].

Even though the performance of VA drastically increases over time, its AI software algorithm is still not at optimal accuracy yet. Studies on VA's comprehension level for recognizing medication names and with different accents reveal a difference in accuracy between 8–11%, which creates a gap for potential future improvements in algorithms of commercial voice assistants [22]. Furthermore, when dealing with information retrieval, VAs were reported to perform poorly in terms of source reliability and not always guarantee the accuracy of the information [17], which creates a gap for improvement in future studies. Another aspect that warrants future improvement is the speed of response exhibited by voice assistants. Notably, applications utilizing Google Assistant have reported slower response times, which may potentially impede timely and crucial responses in sensitive and urgent scenarios [12]. Addressing this issue would contribute to enhancing the overall efficiency and effectiveness of voice assistant technologies.

5 Conclusion

This systematic review critically examines the existing literature on the usability of voice assistants within the healthcare system, an area that has been relatively under-researched within the context of systematic reviews. The qualitative analysis conducted in this review reveals several significant categories where voice assistants play a crucial role in serving diverse populations in healthcare. However, it is important to acknowledge both the limitations of this review and the challenges faced by voice assistants in this domain. To comprehensively address all aspects of usability, future reviews would greatly benefit from incorporating studies that focus on the user's experience and the quality of voice assistants' algorithms specifically in healthcare settings. Given the extensive application of voice assistants in healthcare and the continuous advancement of VA technology, it is essential to place increased emphasis on training VA software to enhance its algorithmic capabilities, response speed, accuracy, voice recognition abilities, and comprehension levels. This will ensure that users in healthcare receive not only a pleasant but also a reliable and effective experience.

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