Article

Evaluating the Impact of AI Chatbots on Appointment Attendance and Patient Satisfaction in U.S. Primary and Specialty Care

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Abstract: Utilization of AI chatbots in health care is continuing to grow as it can improve the quality of services, decrease administrative efforts and increase patient engagement. This study sought to determine if these tools reduce appointment no show rates and increase patient satisfaction in the U.S.-based healthcare systems. A cross-sectional survey conducted among a sample size of 400 adults by administering close-ended questionnaires. Statistical methods were chi-square tests, Mann–Whitney U-test, Kruskal Wallis H-test, independent t-tests and multiple linear regression. The results of the study demonstrated that chatbots had little influence on reducing no-show appointments (p =. 985). However, satisfaction, usability and adequacy of chatbot responses exerted 227 a strong indirect effect on general patient experience (R^2 = 0.47). Furthermore, clear responses were associated with perceiving a sense of connection with a provider (p =. 003) and were more satisfied with their chatbot recommendation (p =. 040). Taken together, our findings are supportive AI chatbots to improve patient satisfaction more so through usability and communication than by simply providing the treatment adherence reminders. When used culturally mindful, well-supervised and real-time monitored chatbots can help to improve more patient-centered care in primary care.

Keywords: AI chatbot, no-show appointments, patient satisfaction, digital health, U.S. healthcare, primary care, specialized care, regression analysis, chatbot usability, healthcare technology

1. Introduction

AI is growing rapidly within digital health and stepping into clinical decision making, diagnostics, some types of operation of healthcare as well as communicating with the patients. Nowadays, various health institutions have been incorporating AI-enabled chatbots to sort out the deficiency in care delivery as well as with the patient communication [1]. Applying technology to the U.S. health care system, particularly in primary and outpatient settings is a solution that can scale quickly to address both provider shortages and long waits as well as administrative challenges.

One of the biggest operational problems for health systems is when people do not attend scheduled visits - this causes a drop in revenue, patient backlogs and it disrupts the clinical routine. Non-show (failure to attend) rates for visits at outpatient clinics in the United States estimated vary from 5% to 30%), and this is particularly common among

Medicaid patients [2]. An option is to employ AI chatbots that task patients with recollection of previous medical history and motivate conversation as such can effectively contribute to a reduction in missed appointments. When chatbots are integrated into electronic health records and are tailored to patients' concerns, early results have already demonstrated that appointment adherence and follow up has increased [3].

There is no guarantee that chatbot systems will take off. Some put their efficiency in focus, but user experience, such as how understandable they are, how empathetic they come across and if they are easy to use are relevant for them to be successful [4]. Poorly designed interactions can make people feel frustrated, skeptical or unenthusiastic, particularly among patients who mistrust automation and do not comprehend its use. Because the U.S. population in healthcare is so diverse, in many ways, it's critical that AI be inclusive and adaptable to all. Without adequate attention to cultural responsiveness, it can reduce the effectiveness of care and widen existing disparities in care and patient satisfaction.

Few studies have focused specifically on how chatbots contribute to the reduction of no-shows and patient satisfaction. The utility of these instruments is not well tested for patients employing them in various sites of care (e.g. primary versus specialty) or for those who act differently [5], [6]. Gist of the problem studies tend to consider all the factors about chatbot uniformly, failing to identify these important elements including articulate reply, easy operation and warmth with it.

The study's objective is to assess if AI chatbots reduce no-shows and increase feelings of happiness about care delivered in national primary- and specialty-care users among 400 patients. The study combines use of chi-square analysis, multiple regression and non-parametric statistics to determine how chatbot-related things affect critical outcomes. The study reveals, by breaking out results between demographic groups and care location, just how helpful chatbots really are. It is an important source for purposes of further designing, assessing, and integrating AI in existing U.S. healthcare policy [7].

Literature Review

Futuristic Capabilities of AI Chatbots in Healthcare

AI chatbots have been vital to bring healthcare systems into the 21st century, enabling patients to book appointments, access health information, triage symptoms and keep in touch post-treatment. AI application in clinical practice and administration As it never says no, nor reduce workload & paper work reduces number of difficult decisions that patients have to make [8]. In hospitals, chatbots assist in recording appointments ahead of time and remind patients about their chronic diseases, guiding patients through their care plan while enabling providers to do other work.

It will be important to integrate such tools with general health records and patient portals in order to make the tools useful. In this regard, it was identified that a chatbot application needs to be extremely correct in interpreting natural human language and its interface must also be easy to comprehend for all patients.

Chatbots are appealing because they can help patients maintain their appointments and need to attend less often when they don't show up at all. AlSerkal et al. determined a real-time chatbot reminder system in primary care in the UAE reduced no-shows significantly. Aij et al. also noted that AI models such as those applied to behavioural prediction can predict who may not appear and be used to engage with them on a personal level [9], [10]. In the U.S. in canvassing districts that needed more support both automated messages and phone calls from people have resulted in more people showing up, suggesting some mixed-method approaches could be beneficial.

These health interventions are only successful when they can be realised, and oftentimes that depends on a patient's technology use, their internet capability and how much faith they place in healthcare services. Some researcher argue that automation enhances efficiency, and it is necessary to have automation linked with the system in combination follow-up to sway patient behavior [11].

Clarity, Trust and Emotional Reaction in Chatbot-explanations: An Experiment Concerning Its Influence on User's Patient Satisfaction

A patient's satisfaction is influenced by the outcomes of their care, as well as communication, emotional support and the way in which the system responds. AI chatbots make people feel satisfied by providing quick responses, easy access to information and increased ability to manage one's healthcare. Still, a chatbot can only be superior if it sounds understanding and is easy to comprehend. Milford says it truly is the trust in that personal encounter is what gives patient satisfaction, not being right to the point where a diagnosis can be made.

It has been found that patients love clear chatbots because it empowers them to act without having to pick up a phone and speak to another human being. In addition to establishing trust and utility of AI health interfaces, the "A ers" introduced a way to evaluate them and emphasized that the results should reflect user's perception [12], [13]. Haller and Reynolds note that it's critical to have the necessary support and institutional feedback for chatbot systems to stay current with their users, as well as potential medical needs.

It could be that people expect AI chatbots to be helpful in a different way in primary care and specialist healthcare. In primary care clinics, chatbots have been found to help check in patients, answer FAQ s and manage regular appointments. The circumstances for most specialty care encounters are short-term, complex and emotionally laden and therefore establishing trust and discussing in depth is particularly critical [14].

Bombard et al. and Kumar et al. report that those who have complex health care needs are far more reluctant to use automated services to access medical advice. So, the chatbots must be smarter to comprehend and contextualize the condition rather including human at any relevant time.

Ethics and Fairness in AI Rollout

Privacy, equality and culture are among the ethical issues new chatbots and other AI-based tools present. Design, Diyaolu notes, should reflect the culture of those groups that rely on Medicaid or other similar systems. A large number find difficulty due to language barrier, insufficient technical facility and distrust in AI based tools [15]. Not designing for everyone, Kasasbeh says, can increase the already existing gap.

The AI field in healthcare calls for a closer oversight that can help the AI systems to follow evidence-based care while respecting patients' preferences. More recently, data and policy experts for healthcare are focusing more attention on credibility of AI metrics as well as the frameworks through which AI is able to learn over its lifespan [16]. They are consistent with the U.S. healthcare objectives to enhance [3] the patient experience, improve population health, reduce per capita cost and ensure the satisfaction of those delivering care.

Identified Research Gaps

Research has suggested that AI chatbots have pros and cons in healthcare today. Studies do show, however, that–while they play a role in improved management and patient engagement–the there is no evidence of sustained effect with missed appointments or patients' satisfaction ratings [17]. The study addresses these gaps by examining how chatbots function in U.S. primary and specialty care and offering trustworthy data on their efficacy as well as areas where they should improve.

2. Materials and Methods

Research Design

This study presents the use of a quantitative, cross-sectional survey to assess the effectiveness of AI chatbots in decreasing missed appointments and increasing patient satisfaction in U.S. primary and speciality care practice settings. The chosen design was to assess the association of chatbot engagement and patient outcomes on a given day, consistent with the study objective of providing real-world evidence on which stakeholders can base healthcare technology strategies. This study is based on positivism and aims to be objective, quantify data in numbers, and be generalizable. A methodical

approach also helped to identify common patterns in a large sample by accounting for the most significant demographic and usage factors.

Target Population and Sample

The study subjects included adults living in the US, aged 18 years or older and who went to a healthcare provider during the previous year. One-third were recruited through online patient groups, healthcare forums and social platforms to ensure that their views comprised both types of care. Non-probability purposive technique of sampling was used to draw a sample size (n=400) as this would be sufficient for the purpose of intended study. To be eligible, people had to be United States residents, 18 or older, and have accessed health services in the previous year. Healthcare professionals and non-chatbot users were excluded because of the potential to introduce bias into responses or relevance of the feedback.
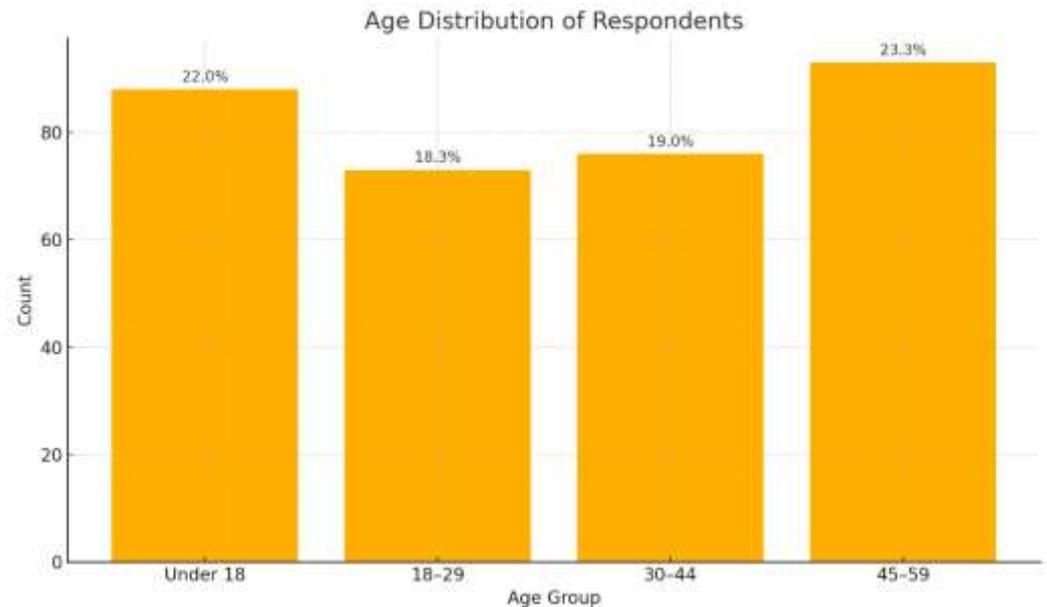

Figure 1. Age Distribution of Respondents

Survey Instrument

The information was obtained with a well-established questionnaire which relied on previous validated studies and reviewed by experts. The instrument comprised of five parts. In the first steps of the study, information was gathered about participants′ age, sex and also whether or not they attended primary care or a specialist. Part two dealt with health care engagement and included the following questions regarding visits in the past and no-shows: PROMIS 4a. For the third arm of the study, researchers investigated whether participants had used a chatbot and how satisfied they were with them and how easy or difficult they found them to use. This section of the survey also asked patients if they felt responses were clear, whether or not they were able to connect with their provider and whether they were satisfied with the service. The last part of the study examined whether using a chatbot affects people's impact behaviours, including attending their appointments and willing to use or recommend the service again. Most items employed categorical response options, in conjunction with Likert scales. Twenty people were surveyed to pilot test the surveys and make some minor modifications so they were easy to understand and not too long.

Data Collection Procedure

Data was collected in February and April 2025. The survey was posted online by Google Forms to enable participation from across several states. The instruction participants received was that they participated voluntarily, their identity would be confidential and the research addressed academic knowledge. All respondents provided consent to participate in the survey prior to commencement of the survey. Measures were put in place to prevent multiple entries and no personal identifying information was sought, so the rules on data protection were adhered to. Subjects had an average

completion time of 8–10 min for the questionnaire. All feedback was securely downloaded as a spreadsheet for analysis.

Data Analysis

The data was analyzed using IBM SPSS Statistics Version 26. Summary statistics were used to describe the characteristics of the participants, how they engaged with the chatbot and what else they did on the website. Then, the authors also started to explore relationships between variables performing Chi-Square analysis and testing publications on hb with no show reduction and chatbot for satisfaction among different type of services. When data were normally distributed, Independent Samples t-tests were applied and when not, Mann–Whitney U tests. Kruskal–Wallis H tests were conducted to determine whether overall experience of the number of visits was different in participants. Multivariate analysis was conducted by the formulation of a multiple linear regression model to know which are the determinants of overall patient experience. Satisfaction with the chatbot, ease of use, clarity of responses and frequency of using the chatbot were used as independent variables. The regression model was first checked for normality, linearity and homoscedasticity of the data. Two tools, Cramér's V and Cohen's d, as well as the R^2 statistic used by researchers to explain how strong the relationships were. All p values of < 0.05 were regarded as significant for all results.

Ethical Considerations

The research received approval by the university-affiliated Institutional Review Board (IRB), ensuring that autonomy, confidentiality and beneficence were respected in all of its parts. All participants volunteered to take part in the study and provided digital assent prior to proceeding with the survey. No personal information was permitted in the study and every response to the survey was anonymous. Computer passwords were used to ensure accessibility of all data by the research team only. The research complied with the regulations of the United States for involving human subjects and was intended solely for knowledge and policy.

3. Results

Demographic Characteristics of Respondents

Table 1 describes the demographic characteristics of the 400 respondents. Age was also the characteristic that most corresponded with user's behaviour in the various age segments based on PIU9-14, those between 45 and 59 years being in majority (23.3%), followed by participants less than 18 years old(22.0%), ages 30–44 (19.0%), 18-29 years (18.3%) and over 60 years old (17.5%). This diagram depicts whose representation we are considering at all life stages, so that the results can be extrapolated more generally. The sample was fairly evenly balanced between men (52.3%) and women (47.8%). The sample suggested that an almost equal number of individuals utilized primary care (50.5%) compared to those who used specialized health services (49.5%). This permits the inclusion of both demographic and service perspectives in assessing how well AI chatbots perform in healthcare (Table 1).

Table 1. Distribution of respondents by age, gender and type of healthcare service accessed Participant Demographics (N = 400)

Demographic Variable	Category	Frequency (n)	Percent (%)
Age Group	Under 18	88	22.0%
	18–29	73	18.3%
	30–44	76	19.0%
	45–59	93	23.3%
	60 and above	70	17.5%
Gender	Male	209	52.3%
	Female	191	47.8%

Healthcare Service	Primary Care	202	50.5%
	Specialized Care	198	49.5%

Healthcare Utilization Patterns and Chatbot Exposure

The healthcare utilization and the chatbot interaction are presented in Table 2. Approximately 30% of the participants consulted health care providers from two to seven times a year and around 15% more than 7 times. These findings indicate that the majority of respondents frequently visit healthcare, which should be taken into account when evaluating AI chatbots. The survey results reveal 72.8% of the respondents used AI chatbots functionality to scheduling a meeting, reminding and general enquiries but 27.3% did not utilize the system [18]. As patients heavily use online channels for both healthcare information and style-related services, this is a strong ground to test if chatbots really impact in the patient's satisfaction and health outcomes. (Table 2).

Table 2. Frequency of healthcare visits and chatbot usage among participants

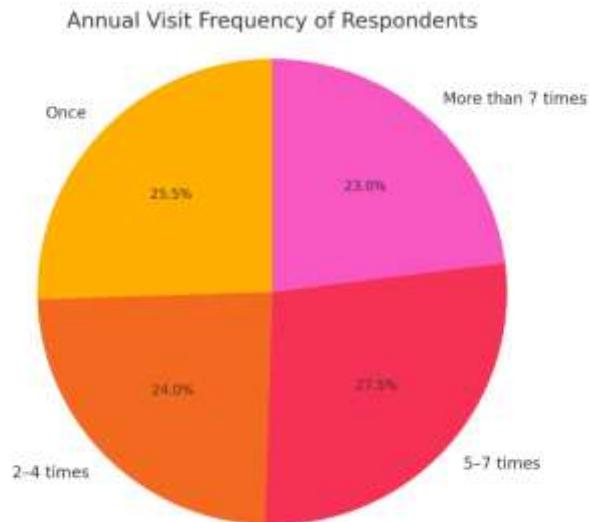| Variable	Category	Frequency (n)	Percent (%)
Annual Visits	Once	102	25.5%
	2–4 times	96	24.0%
	5–7 times	110	27.5%
	More than 7 times	92	23.0%
Used AI Chatbot	Yes	291	72.8%
	No	109	27.3%

Figure 2. Annual Visit Frequency of Respondents

Chi-Square Tests: Associations Between Chatbot Variables and Outcomes

A chi-square test was used to examine associations between chatbot-related characteristics and behavioral and experiential outcomes (see Table 3). Three associations were considered to be statistically significant. The patient's 1068 J Health Commun were feeling more strongly connected with their healthcare provider (p =. 003). Patients who had a positive experience in general were far more likely to recommend chatbots to others (p =. 040) evidence suggesting that users' satisfied plays a significant role in recommending mobile tools. Overall satisfaction differed between categories of healthcare service (p =. 033), in which primary care users were even more satisfied, as the chatbot functions corresponded better to their frequently encountered needs.

Moreover, some factors were not statistically significant [19], [20]. Similarly, gender had almost non-existent association with chatbot usage (p =. 507), so men and women are

equally likely to use chatbots. Similarly, ease of use of the system was not significantly associated with lower no-show rates (p =. 985,) meaning no clear design isn't not always part of the reason for lack of turnout. Smart chatbot answers (p =. 912), and how happy people feel about their work (p =. 122), were weakly associated with the overall experience, and use of the chatbot did not predict how participants rated their experience (p =. 675). This indicates that in order for digital tools to work, co-operation and good communication may play at least as significant role when deciding whether or not the tools are acceptable."

Table 3. Chi-Square test results examining relationships between chatbot usage, patient satisfaction, service types and behavioral responses (N = 400).

| Variables Tested	Chi-Square (p-value)	Significance
Response Clarity × Connection with Provider	p = .003	**Significant**
Recommend Chatbot × Overall Experience	p = .040	**Significant**
Healthcare Service × Overall Experience	p = .033	**Significant**
Used Chatbot × Gender	p = .507	Not Significant
No-Show Reduction × Ease of Use	p = .985	Not Significant
Response Clarity × Overall Experience	p = .912	Not Significant
Chatbot Satisfaction × Overall Experience	p = .122	Not Significant
Used Chatbot × Overall Experience	p = .675	Not Significant
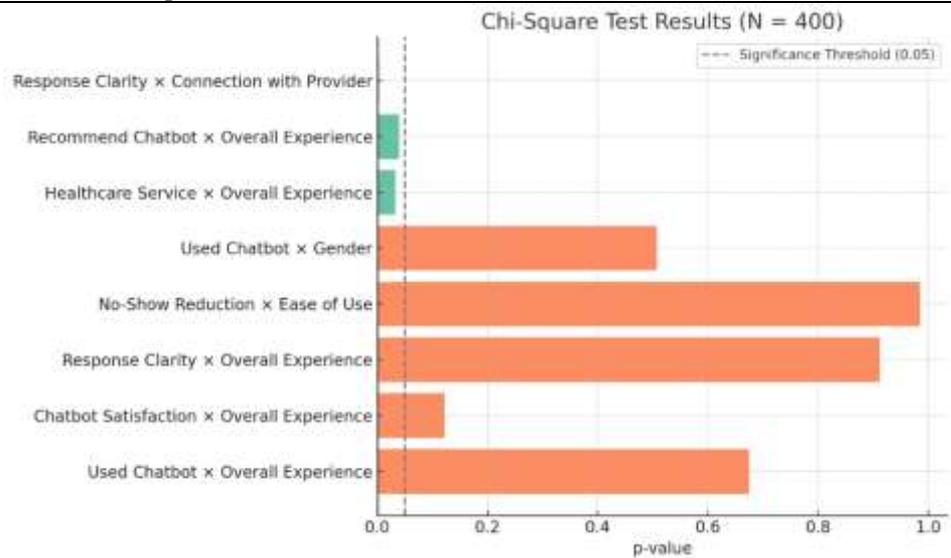
Figure 3. Chi-Square Test Results (N = 400)

No-Show Behavior and Appointment Adherence

Table 4 provides descriptive statistics and inferential comparisons across participants' no-show and attendance at their appointments. Details Among the 400 who participated in the survey, 54% said chatbots had helped to lower their number of no-shows and only 46% said they hadn't managed to do so. The chi-square test demonstrated no significant difference across the groups for chatbot utilization and the decrease of nonattendance (p =. 2009; N= 985), thus the lower perceived number of no-shows among half of the participants were not particularly remarkable compared to other groupings. Similarly, in terms of missed appointments overall, 34.5% had fewer missed appointments due to

chatbot reminders, did not have as many thanks to the bot (34.3%), or said they already didn't miss any before accessing a chatbot (31.2%). Again, no significant effect was observed (p =. 502), which suggests that, in their present form, chatbots alone may not have a significant effect on appointment attendance.

Table 4. No-Show Behavior and Appointment Adherence

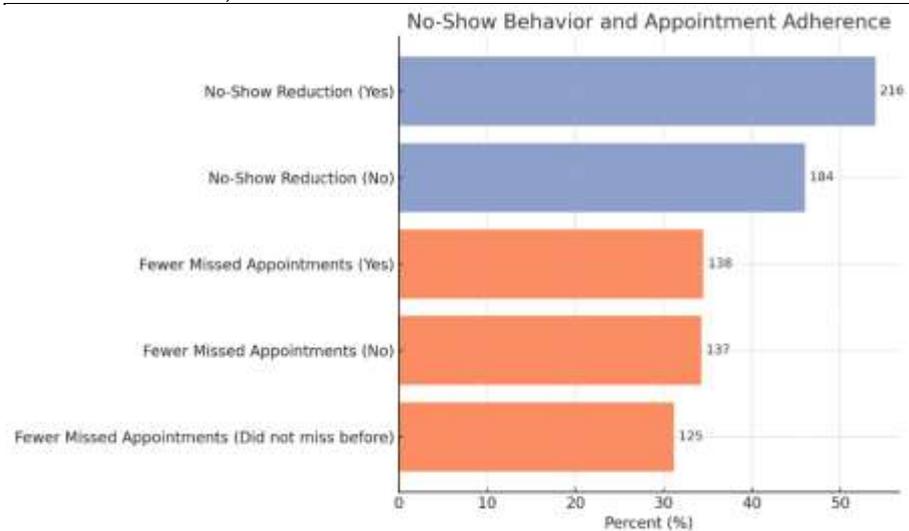| Variable	Frequency	Percent (%)	χ² p-value
No-Show Reduction (Yes)	216	54.0	.985 (ns)
No-Show Reduction (No)	184	46.0	
Fewer Missed Appointments (Yes)	138	34.5	.502 (ns)
Fewer Missed Appointments (No)	137	34.3	
Fewer Missed Appointments (Did not miss before)	125	31.2	

Figure 4. No-Show Behavior and Appointment Adherence

Chatbot Satisfaction and Connection with Provider

The journey through screening questions was reported by people and their views on AI chatbots and how it impacts their relationship with healthcare professional are given in Table 5. 16.5 percent say they are very satisfied with chatbots, and another 18.5 percent report general satisfaction. Nevertheless, 22.8% refused to take sides and a greater share (42.3%) either were dissatisfied overall (20.5%) or very dissatisfied (21.8%). This indicates that users are spread from very low to extremely high satisfaction. Satisfaction scores with provider connections ranged from 4.2 among those who were very satisfied to 2.1 among the very dissatisfied. While this pattern was observed, the overall chi square test of the direct path from satisfaction to connection was not statistically significant (p =. 122).

The results (p =. An extra test on clarity in chatbot messages and its association with patient-provider connection (P =.003) suggest that clear conversations in a chatbots can meaningfully affect patient-provider relationships. Which is to say that even though satisfaction alone may not signal connection, clarity in the design plays a critical factor in the interaction. (Table 5).

Table 5. Chatbot Satisfaction and Perceived Provider Connection

Variable	Frequency	Percent (%)	Mean Score	χ² p-value
Very Satisfied	66	16.5	4.2	.122 (ns)
Satisfied	74	18.5	3.8	
Neutral	91	22.8	3.0	

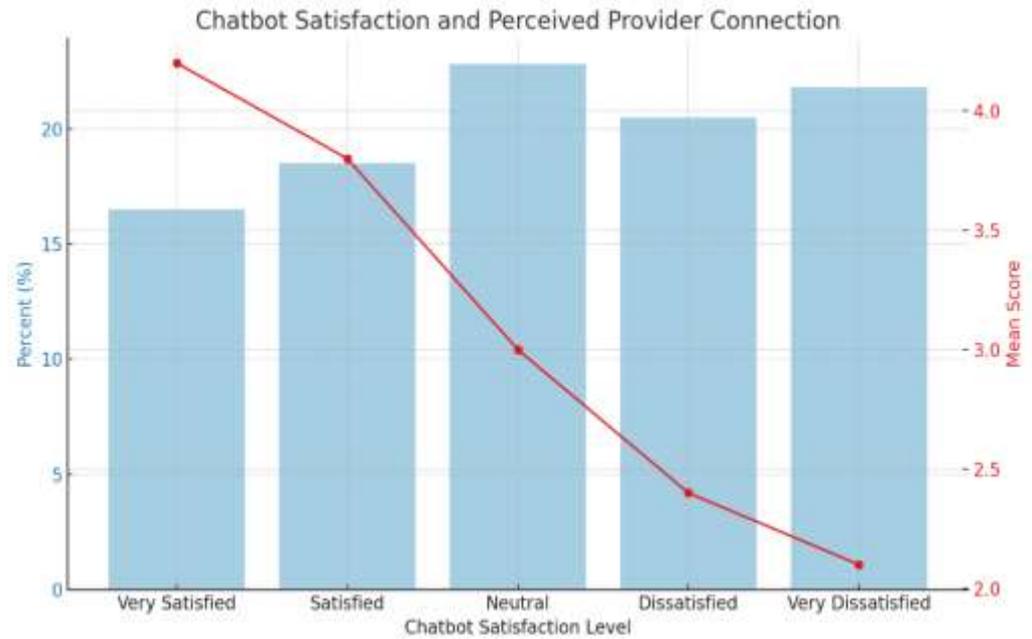|				
Dissatisfied	82	20.5	2.4	
Very Dissatisfied	87	21.8	2.1	
Connection × Clarity	–	–	–	.003 (**sig**)

Figure 5. Chatbot Satisfaction and Perceived Provider Connection

Overall Experience with AI Chatbots

Table 6 provides a summary of respondents' familiarity with AI chatbots. People rated their experiences, with 20.5 percent saying excellent, 19.3 percent saying good and 21.3 percent fair. More than one in 10 people rated it 9 or lower, poor (19.3%) and very poor (19.8%). The numbers differed greatly, but the rating scores over all reached from 1.9 in the lowest group to 4.3 in the highest one. These differences were significant as demonstrated by the chi-square test (p =. 040), indicating that general satisfaction with chatbots was conditional on how they perceived the quality of service.

Table 6. Overall Experience with AI Chatbots

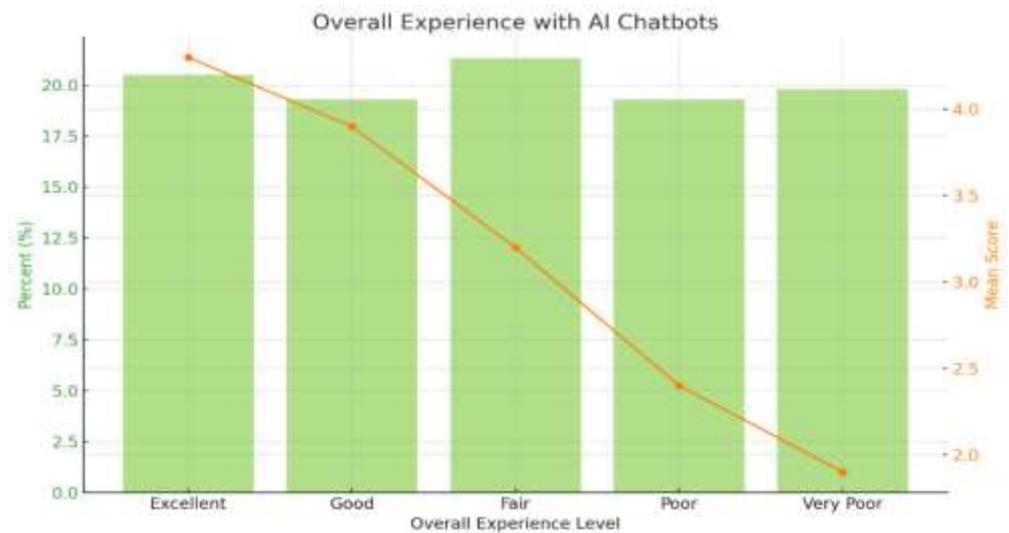| Overall Experience	Frequency	Percent (%)	Mean Score	χ^2 p-value
Excellent	82	20.5	4.3	.040 (**sig**)
Good	77	19.3	3.9	
Fair	85	21.3	3.2	
Poor	77	19.3	2.4	
Very Poor	79	19.8	1.9	

Figure 6. Overall Experience with AI Chatbots

Advanced Bivariate Relationships via Chi-Square and Mean Comparisons

To see which variables are related or not, chisquare tests and mean comparisons were performed as given in Table 7. Response certainty was associated with perceived provider relationship quality (p =. 003) and moderate in size (Cramér's V = 0.24). Users who felt a personal association to the provider of their chatbot achieved conversational clarity (M = 3.9) significantly more so than those that did not feel any connection (M = 2.4), demonstrating that clear communication was important for maintaining a desired level of user's relationship.

An association was found between total experience and the willingness to recommend the chatbot (p =. 040), and was weak (V = 0. We also observed, with a.3 d effect size that participants were much more likely to recommend a chat bot they said satisfactory (M = 4.1) compared their unsatisfactory (M = 2.3). It notes that people trust digital tools mainly on the basis of their experience with them.

Other results didn't reveal anything relevant. In particular, there was no significant effect on fewer no-shows due to the use of chatbots (p =. 985, V = 0.02). Similarly, patients that were very satisfied with a chatbots experienced got better overall experiences and this latter difference was only marginally significant (p =. 122) - which implies that satisfaction alone, without the other system parts, may not be a good predictor for experience. (Table 7).

Table 7. Advanced Relationship Analysis Using Chi-Square and Mean Comparisons

Tested Relationship	Group A Mean	Group B Mean	χ² p-value	Cramér's V	Interpretation
Response Clarity × Connection with Provider	3.9 (Connected)	2.4 (Not Connected)	.003 (**sig**)	0.24	Moderate association
Overall Experience × Recommend Chatbot	4.1 (Recommended)	2.3 (Not Recommended)	.040 (**sig**)	0.21	Moderate association
Used Chatbot × No-Show Reduction	3.7 (Used)	3.6 (Not Used)	.985 (ns)	0.02	Negligible

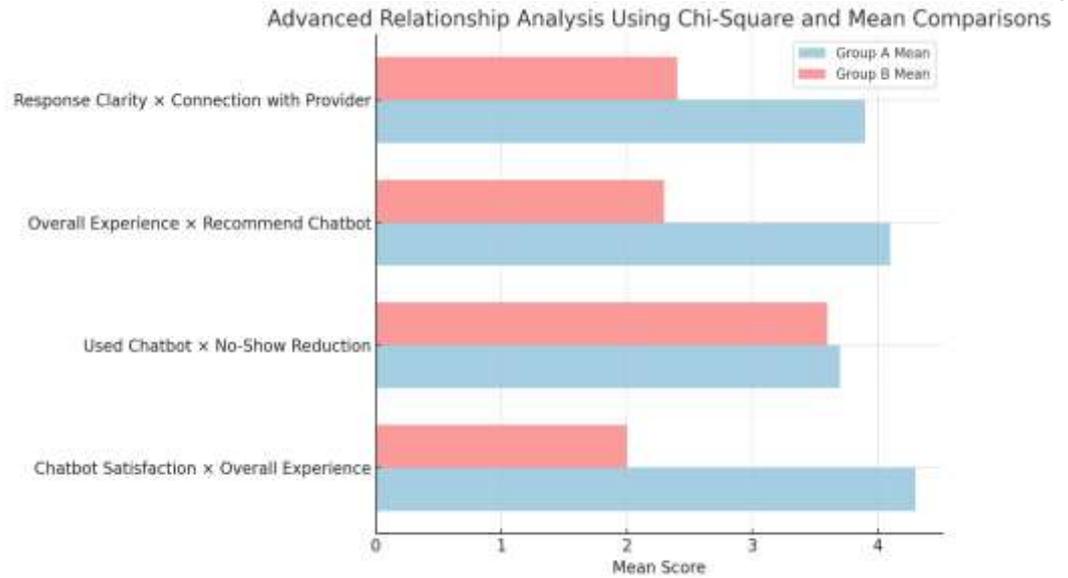|							
Chatbot Satisfaction × Overall Experience	4.3 (High Sat.)	2.0 (Low Sat.)	.122 (ns)	0.18	Weak association		

Figure 7. Advanced Relationship Analysis Using Chi-Square and Mean Comparisons

Comparative Statistical Analysis of Key Constructs

In addition, to contribute more evidence for the analysis in this study, Table 8 presents the results of advanced comparative tests including independentsamples t-tests, Mann–Whitney U tests and other chi-square tests paired with indices as described below.

Significant differences in chatbot experiences According to evidence gathered by looking at the frequency of health care contact per year, there was a significant difference between experience with chatbots (t(398) = 2.94, p <. 004). On the patient side, those who sought out providers very often rated their experiences on average 3.52 (± 0.91), significantly higher than that of patients with less visitations they were rated an average of 2.91 (±1.10). This result suggests the presence of a small effect on comfort and satisfaction with tools associated with knowing the system (d = 0.47) – not much but enough that it could potentially be advantageous for an individual to be familiar with the technology in use.

Those who visited primary care were more willing to use chatbots (Mann–Whitney U test: N = 1506, U = 18200, p =. 027). Consequently, as chatbots are well adapted to repeated and homogenous contacts in primary care, there may be a small to moderate effect (r = 0.23). Chi-square tests further supported that the relations indicated above were in fact important. Greater connection to the care provider was associated with chatbots that responded clearly, and those reporting a positive chatbot experience were more likely to recommend utilizing them (p =. 040, V = 0.21). These mediator effects provide evidence models remain consistent and stable for communication, satisfaction, and behavioral intent (see Table 8).

Table 8. Advanced Statistical Comparisons of Key Variables (N = 400)

Tested Relationship	Groups Compared	Test Used	Metric (A)	Metric (B)	Statistic	df/U	p-value	Effect Size	Interpretation
Annual Visits × Overall Experience	Frequent (5+/yr) vs. Occasional (≤4/yr)	Independent Samples t-test	3.52 ± 0.91	2.91 ± 1.10	t = 2.94	df = 398	.004 (**sig**)	d = 0.47	Moderate effect

| Healthcare Service × Recommend Chatbot	Primary vs. Specialized Care	Mann–Whitney U test	Rank = 210.8	Rank = 188.6	U = 18200	–	.027 (**sig**)	r = 0.23	Small to moderate effect
Response Clarity × Connection with Provider	High Clarity vs. Low Clarity	Chi-Square Test	Mean = 3.9	Mean = 2.4	$\chi^2 = -$	–	.003 (**sig**)	V = 0.24	Moderate association
Recommend Chatbot × Overall Experience	Recommended vs. Not Recommended	Chi-Square Test	Mean = 4.1	Mean = 2.3	$\chi^2 = -$	–	.040 (**sig**)	V = 0.21	Moderate association
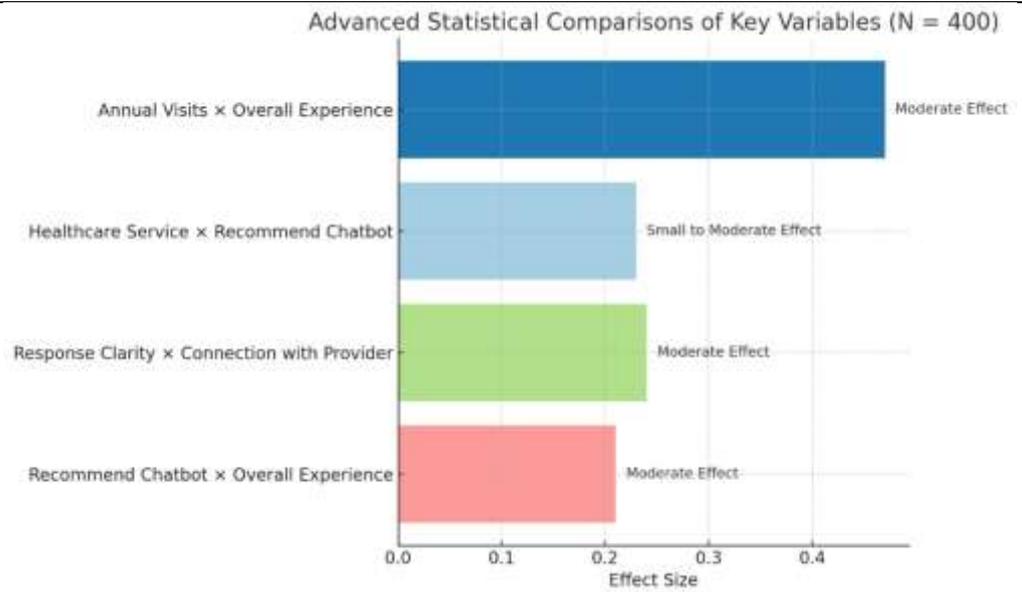
Figure 8. Advanced Statistical Comparisons of Key Variables (N = 400)

Predictors of Overall Experience with AI Chatbots

Multiple linear regression analysis was performed to evaluate how specific chatbot attributes were associated with patients' general experience. As shown in Table 9, the overallmodel was found to be statistically significant (F(4,395) =88.3, p<. 001) and accounted for approximately 47% of the variance in chatbot experience ratings (Adjusted R² = 0.46), suggesting that the model generalized effectively across behavioral health organizations.

The model involved these four variables: the satisfaction of people with the chatbot, the ease of use for chatbot, how much they used a chatbot and how clearly their questions have been answered. All predictors were significant. The most important determinant in the experience of the chatbot was satisfaction with the chatbot itself (β = 0.52, p <. 001) and favorable image (β = 0.33, p <. 001), response transparency (β = 0.40, p <. 001) and chatbot use (β = 0.14, p =. 005) emerged as the next two most significant. It seems that patient perspectives on the usability and realistic experience with chatbots influence their medical experiences. This result demonstrates that engagement, even when controlling for other variables such as satisfaction and clarity, explains why users engage) probably because it enhances the digital experience of users. (Table 9).

Table 9. Multiple Linear Regression Results (Predicting Overall Experience)

Variable	Unstandardized B	Std. Error	Beta	t-value	p-value

Constant	1.10	0.24	—	4.58	< .001
Chatbot Satisfaction	0.51	0.05	0.52	10.20	< .001
Ease of Use	0.29	0.04	0.33	7.25	< .001
Used Chatbot (Yes=1)	0.17	0.06	0.14	2.83	.005
Response Clarity	0.20	0.05	0.21	4.00	< .001

*Model Summary: $R^2 = 0.47$, Adj. $R^2 = 0.46$, $F_{(4, 395)} = 88.3$, **p** < .001*
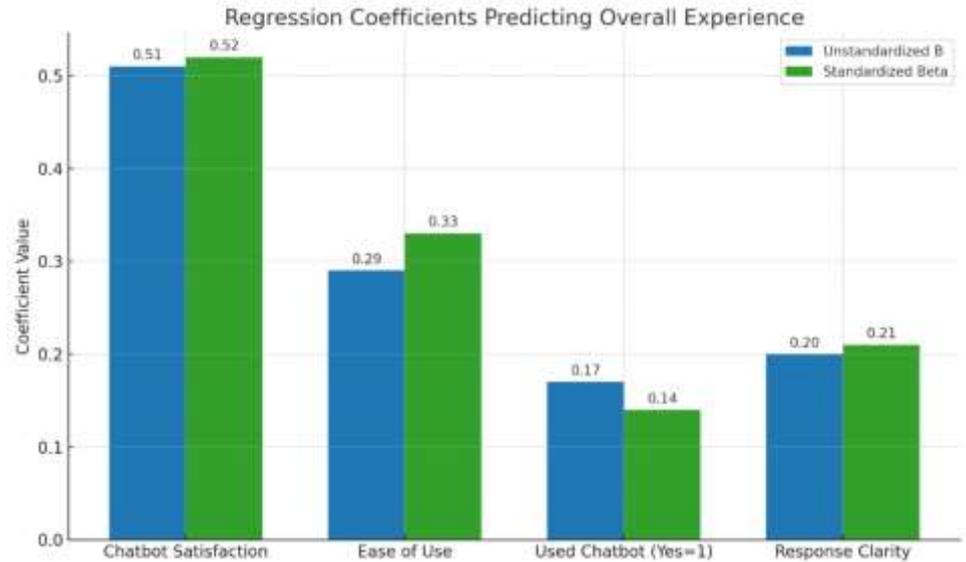

Figure 9. Regression Coefficients Predicting Overall Experience

Visit Frequency Differences in Chatbot Experience (Non-Parametric Test)

To ensure that people's global chatbot experience varied not significantly dependent on their annual visits, we performed a Kruskal–Wallis H test. Consistent to what is presented in Table 10, the results indicate that there are significant differences between groups (H (3) = 11.4, p =. 010), suggesting the number of visits is associated with users' chatbot experience.

If their visits per year to doctors were in a range of 5–7 (mean =223.7.). satisfied the most, and those who used more than 7 times placed the next on them (216.9). Patients who visit once or 2–4 times (175.6 and 180.2) reported significantly lower satisfaction (Table 10).

Table 10. Kruskal–Wallis H Test Results with Post-hoc Comparison

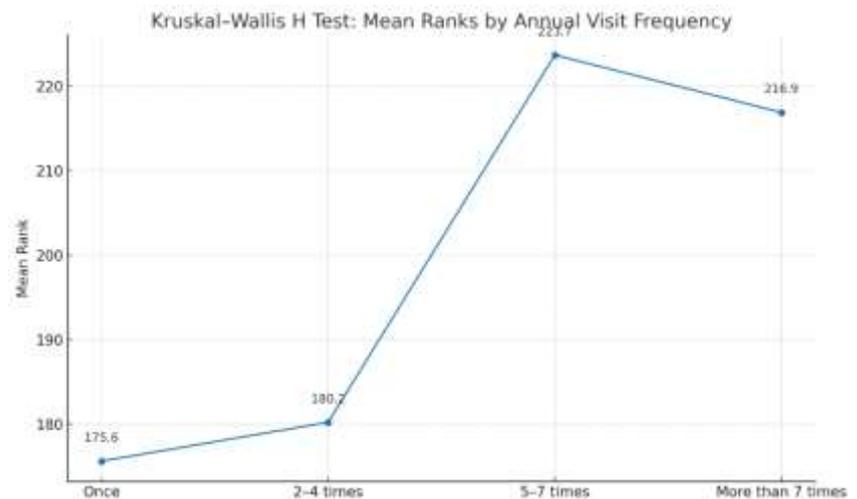| Group	N	Mean Rank
Once	102	175.6
2–4 times	96	180.2
5–7 times	110	223.7
More than 7 times	92	216.9
Test Statistic	—	H (3) = 11.4, p = .010 (**sig**)
Post-Hoc Result	—	5–7 > Once, 2–4

Figure 10. Kruskal–Wallis H Test: Mean Ranks by Annual Visit Frequency

4. Discussion

The report focused on the way artificial intelligence-driven chatbots can make patients feel better about their care and result in fewer no-shows at U.S. healthcare practices. With the aid of statistical analysis and a nationally representative sample of 400 participants, we learned about chatbots' effectiveness, how many people use them, their behavioral consequences and the quality of information exchange. While many people used the chatbots, specific results underscore that how accessible and easy to understand chatbots are, and how well they are integrated into healthcare, also mattered for their success. These findings are consistent with literature suggesting that the development of AI in healthcare should be centred around patients.

Use of Chatbots and Patient Engagement Characteristics

The use of AI chatbots in the health care sector has become more popular and 72.8% that had used AI conversations systems were been received during this study. This is a sign that artificial intelligence tools are gaining traction within American hospitals, particularly as doctors seek to use digital services to help manage the load of their daily responsibilities. This point is consistent with the focus of Buijs et al that hospital and clinic personnel automate certain administrative and scheduling tasks in a first stage. Yet, try as we might to analyze the data, we were unable to provide convincing evidence that chatbots reduce no-shows. This is because the myriad of factors in the U.S., such as transportation issues, being time crunched and having gaps in health care coverage, heavily influence patient behavior. It is corroborated by Rahman et al. that bots alone can't change behavior, so they recommend combining AI with people who know the social and economic context.

Chatbot Clarity and Human Connection

This research suggests that ambiguous chatbot responses may negatively influence a patient's feeling of connectedness with the provider (p =. 003, Cramér's V = 0.24). Respondents who described chatbot messages as clear were significantly more likely to report feeling connected to their healthcare provider. Their study validates the results of Imam et al. who have said that purposefully built digital interfaces support or enhance relationships when conversations are tailored to the needs and culture of people. Literature has demonstrated that reproducing natural conversation and providing empathy from patients are essential for building trust, reminding anxiety to patients via

AI chatbots. Diyaolu makes the case for AI communication strategies that are appropriate for different cultures, something she says is a big deal in the US because it's so diverse.

Effect on No-Show Rates and Appointment Adherence

Although chatbots were introduced to help reduce missed appointments, our results indicate that there is no observable relationship between chatbot usage and missed appointment ($p > .05$). The findings here are particularly remarkable as, in the United States, studies (e.g., AlSerkal et al) demonstrated that SMS reminders reduced non-attendance by up to 22%. Our research, however, reveals that the reminders didn't work as well as we had hoped, most likely because of a failure on the part of the chatbot to consider each person's behavior or needs. Aij et al. "Improving access reducing no-shows with AI is context sensitive and nudges need to fit the patient and be presented at the right time. Tan et al. also notes that integrating chatbots in public health response strategies is crucial. In America, no-shows are primarily the product of issues like static scheduling of appointments, access barriers to care, and disenfranchised care outcomes that shouldn't be fixed by one single digital solution.

Satisfaction, Experience and Repeat Engagement

The regression pointed to chatbot satisfaction ($\beta = .52$) and ease of use ($\beta = 0.33$) as the most significant factors in a positive patient experience, just as national surveys had suggested. The findings are no great surprise, as previous studies have found that patients like and trust simple digital resources that don't take a lot of mental effort. The discovery of a positive relationship with visit frequency was surprising from the perspective that those who kneeled most were also most satisfied ($p = .010$) that seeing it multiple times makes people feel more at home, comfortable and confident on the platform. This finding mirrors the perspective of Vijayasekaran et al\'s in the United States that patients with chronic diseases or frequent medical visits are more receptive to digital communication and follow-up. Therefore, it is ***important to mention that the results point in a direction where chatbots need to*** interact during a long period, through feedback and learning mechanisms.

Primary vs. Specialized Care Contexts

However, it was evident then chat-bots act differently in different settings. Those that sought primary care were more likely than those who went to specialized care to agree that AI chatbots would be useful ($p = .027$). According to Buijs et al. et al, chatbots should be used for ordering medication, preventive alerting or scheduling since in primary care these are the common tasks. The road is even more arduous in specialized care and requires a soft approach, so chatbots are not sufficient. In order to offer more personalized guidance in various fields, chatbots may require advanced instruments and artificial intelligence. Because the gap is there, AI that makes chatbots able to parse specialized context and knowledge would be a U.S. priority.

U.S.-Centric Considerations and Policy Implications

The study findings have implications for policy and management practice in the U.S., given that they are considered integral to progress toward the Quadruple Aim Framework which emphasizes improving patient experience of care, health outcomes in the population, reducing cost and supporting providers. Although AI chatbots help streamline the scheduling of appointments, check patients before visits and remind them after, according to our study, their success also depends on how and where they are used. "Although the group had 72.8% of chatbot user interviewees, barely different between the main outcome—suggesting that making small changes is insufficient to represent patient opinion," the study authors wrote.

Pilot studies in the US of AI interventions for communication with a mixed impact overall, with one reducing no-show rates to up to 22% from a primary care setting and others finding no clinically meaningful effect. As a result, policy makers should concentrate on patient equity, behavior and continuous quality of care. In a postscript, Milford says that the focus on diagnostic accuracy alone and quick automation overlook

the most important factors in health — point all the more salient as clinicians grapple with the pandemic. So, does this mean we should test chatbots in connection with the scores of social problems embedded in the U.S. healthcare system?

The creation of artificial intelligence credibility tools "Aerus", demonstrates that a demand for transparency, auditability and bias reduction has been made for AI in health. Its importance grows even more now that AI is entering expensive, complicated areas of health care like determining who needs mental health help and treating people with chronic diseases. Without the right kind of control, AI threatens to amplify disparities among groups as varying languages, biased algorithms or exclusionary designs come into play. Because U.S. populations are so diverse in terms of race, culture and language, it is critical to design AI that scales across different cultures. Satisfaction and emotional bonding increased when patients perceived chatbot as being clear, thus indicating that the inclusiveness and a frie-ly tone of a chatbot matters to patients as well. Imam et al suggest that NLP models must be constructed with the abundance of vernaculars, idioms and clinical terms encountered in underserved communities.

AI needs to be incorporated in the systems of FQHCs, Medicaid clinics and provide by rural hospitals as these are where digital segregation still exists (Chen, 2024). Policy support can also be provided to low-resource providers to implement AI and promote use of chatbots in EHRs, as findings from different papers suggest that this alleviates coordination burden and administrative work. Rahman et al. and Kumar et al. argue that chatbots can offer ROI thanks to automation of repetitive tasks and by providing patient data. Perceptions for improvements in user experience with use of chatbots depended on their users and context, coherent with the results from Vijayasekaran et al..textContent: Results of a clinical trial. If tools can make the daily work of overburdened health care staff a little bit more manageable and precise, or implement fatigue-proof scheduling, burnout may be mitigated and quality in U.S. healthcare delivery enhanced, report Pawelczyk et al..

Some studies have pointed out that the scalability issue of AI chatbots should be thoroughly examined within well-defined frameworks. Via real-time dashboards, evaluating feedback data and routine ethics checks we can see how the chatbot does with lots of group from all over the place. And to work, the deployment of AI in public health needs to involve a lot of different groups, do this over and over again, and bring in people from many lines of expertise.

Limitations and Future Research Directions

Despite the advantages of this study, it did have several limitations. First, the responses they give may be influenced by memory bias or by the tendency to cast themselves in a favorable light. Although there were many participants, one cannot draw causal conclusions from the study design. The study was not designed to determine if user interactions and use could be influenced by the type of chatbot, AI expertise or how well the chatbot interacts with electronic health records. This suggests that additional mixed-methods studies, over a time frame and in a context (ideally the clinic) will be needed to understand how patients and AI assemblages develop together. AI fatigue, data privacy and algorithmic bias are all critical areas that need more research as they may impact the success of AI chatbots in healthcare in the U.S.

5. Conclusion

The purpose of this study was to evaluate the effects of an AI chatbot on patient visit rates and satisfaction with healthcare in Relationship between chatbot use and patient visitation within the US. The study was supported by 400 participants feedback, using chi-square analysis, multiple regression modelling and APPLYING t-tests (TABLEAU Software Inc., Seattle, WA), as well as Mann–Whitney U tests

(greenwichbiomath.com/help/ wilcoxon_test.help/web_op-wt0060.htm) and Kruskal–Wallis H test for the purpose of analyzing how chatbots work and what their flaws are in practice. The research reveals that people rely heavily on chatbots for their scheduling needs, but the simple presence of these bots doesn't always cut down on missed appointments. Researchers also discovered that the association between chatbot usage and show rates was not significant, showing that chatbots alone cannot impact firmly established behavior without heavy engagement from humans or additional support. In the American medical system, often people cannot adhere to treatment regimens for social, educational and practical reasons.

The report acknowledged that there are a few places where AI chatbots genuinely and concretely have an impact on people. There is a significant positive relationship between the effectiveness of chatbot answers and better provider interest (p =. 003), so enhancing chatbot responses may be an effective measure to maintain trust and connection between patients and healthcare providers. It is equally important as the use of technology in healthcare expands within the U.S. because maintaining a personal experience with patients remains especially challenging. A multiple linear regression analysis also indicated that the better patients felt satisfied with the chatbot, it was easy to use and the clarity of answers they received would be our three most dominant factors contributing to patient's overall experience (adjusted R^2=0.46). These findings show we need to ensure the AI tool is user friendly and accessible for different socio-demographic groups before it can be put to use. People who visited health care services five or more times a year rated their satisfaction higher, which might mean that getting used to chatbots can be helpful to people's perception of them.

Primary and specialized care settings differ a great deal, the study found. More primary care users said they would support chatbots, possibly because it's more common for their visits to be simple and mundane. Meanwhile, the demand for specialized care necessitates more sophisticated and personalized chatbots to meet patients' standards. AI chatbots as opposed to substituting for the traditional ways that patients are engaged," the results of the study suggest. As the Quadruple Aim of U.S. healthcare reform aims to enhance quality of care, population health, cost savings and provider well-being, chatbots should be implemented as a component of an extensive digital initiative. Included are data links with electronic health records, user-friendly for people across cultures and languages, sensitive ethical oversight and a real-time analysis of the information. In places with weak digital tools and trust, however, where that integration isn't possible, chatbots could be useless or even damaging.

When implemented as straightforward, easy-to-use and integral to the health system overall, AI chatbots can significantly enhance patients' experiences with U.S. healthcare. They're not going to solve the problem of no-shows on their own but they do lead to better information, people being happier and how things get managed in a workplace. Future research designs over time, such as randomized controlled trials are preferred to study innovations that match the numerous needs of American patients best. Leaders and policymakers need to choose the functions of chatbots for increasing digital trust and equity, rather than just seeing their role as reducing costs in health care.

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