Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

THE ROLE OF AI AND IOT IN STREAMLINING COMMUNICATION BETWEEN FAMILY PHYSICIANS AND PATIENTS

Shehzina Arub[1], Dr. Munazza Jabeen[2]

[1] Staff Nurse, Department of Health, University of Health Sciences

Email: mrsbilal1124@gmail.com

[2]Assistant Professor, International Institute of Islamic Economics, International Islamic University, Islamabad, Email: munazza.phdeco151@iiu.edu.pk

Corresponding Author: Shehzina Arub, Staff Nurse, Department of Health, University of Health Sciences, Email: mrsbilal1124@gmail.com

ABSTRACT

Background: AI and IoT can enhance interaction between family physicians and patients; this can be reached by integrating both Artificial Intelligence and the Internet of Things in healthcare. However, the level to which these technologies have enhanced the communication process is still a matter of some debate.

Objective: This research proposes to ascertain the applicability of AI and IoT for F2G communication, engagement, and interaction by ascertaining their usage, performance in communication efficiency and effectiveness, satisfaction among patients, and effect on patient care.

Methods: To achieve this research goal, the authors used quantitative, cross-sectional survey questionnaires completed by 250 respondents – both patients and FPs – who had previously interacted with AI and IoT in the context of healthcare communication. Questionnaires were self-completed online, and the analysis incorporated the Shapiro-Wilk test, Cronbach's Alpha, and regression analysis to test normality, reliability, and AI and IoT on communication impact.

Results: Therefore, the outcomes revealed that the integration of AI and IoT in healthcare communication remains relatively limited; overall, 32 % use AI tools once a month, and 23 % use


Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr


them 2 times per month. It was observed that data were not normally distributed by using the Shapiro-Wilk test. Cronbach's Alpha was 0.04, therefore the reliability of the AI and IoT questions was low, and regression analysis showed that variation in communication effectiveness could only be explained by AI and IoT usage to the extent of 1%. However, IoT tools gave patients a fairly good level of control regarding their health.

Conclusion: The use of AI and IoT consequently presents benefits in improving the communication between family physicians and patients, as is the case now though not to the greatest extent. Therefore, to fully optimize its usage, there is a need for enhancement of usability, accessibility as well as reliability, and enhanced user support. Still, there are opportunities for both AI and IoT to enhance patient control and healthcare results.

Keywords: AI, IoT, health care, family practices' doctors, paradigm of patient control, quantitative research.

Introduction

AI and IoT are fast evolving and this has affected most industries, including the healthcare industry. They demonstrated high potential in changing how healthcare consumers, in particular primary care physicians, interact with their clients. AI will be an invaluable tool for personal preventive advice and choosing among possible treatments by providing different options to the medical practitioner; IoT, in Silicon Valley, includes wearables and constant monitoring devices allowing for constant close-up monitoring of the patient's state. When integrated, AI and IoT are expected to drive improvement in the manner communication in the health sector is conducted (Waheed & Liu, 2024) (Kalusivalingam, Sharma, Patel, & Singh, 2021).

Although now everyone knows that there are numerous advantages to the use of AI and IoT systems and technologies, it is still unclear to what extent physicians and family consumers have been successful in providing simple and meaningful communication between them. The principles of communication require implementation so that patients are diagnosed early, they get the best services from practitioners, and good health results are achieved. As we observe an increasing rate of digital solutions implementation in the sphere of healthcare, it is essential to know how AI and IoT can help enhance these fields (Prabhod, 2024) (Patil & Shankar, 2023).


Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr


Over the last couple of years, there have been innovations in the healthcare sector, which include artificial intelligence and the Internet of Things. These technologies can prospectively transform healthcare communication, especially the family physicians and their patients. An important quality of healthcare delivery is communication, which makes possible proper diagnosis, timely and appropriate treatment, and even, improved health. Thus AI and IoT technologies are gradually being thought of as means to enhance the communication process and deliver optimal, unique, and data-tailored experiences. AI, for example, can give individualized health advice, help determine patients' conditions, and suggest decisions for doctors; IoT, including wearables and distant health monitors, can track health conditions chronically. Cumulatively, these technologies hope to enrich communication by offering real-time information and timely medical advice (Rangasamy, Rajamohan, Basu, Menezes, & Chongder, 2024) (Zeadally & Bello, 2021).

Although the use of AI has not yet invaded the medical field, it has started to change healthcare by improving the application of communication technology. Virtual health assistants and diagnostic applications, chatbots, and automated decision support can alleviate the communication load for physicians while potentially providing patients with more immediate access to health knowledge. These tools can offer immediate replies to common questions of a health nature, offer recommendations for treatments, and also set appointments so that patients can manage many of their healthcare-related issues without guidance from a physician. Furthermore, AI can be deployed in terms of predictive, finding out when patients might require additional treatment or when they require to be prevented, it can also assist in more anticipatory and preventive healthcare communications (Aminizadeh et al., 2024) (Emadi, 2023).

Likewise, IoT has provided patients and doctors new approach to patient monitoring through remote technologies. Real-time health data are gathered by IoT use cases including fitness trackers, smartwatches, glucose monitors, and blood pressure cuffs, delivering the data straight to healthcare providers. If done continuously, it will assist in identifying new conditions that a patient is developing which can be fatal, in good time before the situation gets out of hand. Not only that, IoT devices give patients the control of real-time health information to promote patient engagement. By providing a constant stream of information exchange between a patient and a

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

physician, IoT can improve communication and deliver better strategies for patient treatment (Sarella & Mangam, 2024) (Kothamali, Srinivas, Mandaloju, & Kumar Karne, 2023).

But at the same time despite all these possibilities it is also important to note some possible problems arising from using AI and IoT in healthcare communication. Some of the issues include; Data privacy and security another issue that remains a potential major issue. Since these technologies depend on the transfer of health information, methods of locking down this kind of information must be put in place. Another crucial issue one cannot overlook is the digital divide. While some of the patients will be able to navigate through AI tools and IoT devices, others will lack the knowledge to participate in these innovations. In particular, significantly older patients or those living in populations with restricted access to healthcare might not be able to avail of these technologies, which will accordingly increase inequalities (Khalifa, Albadawy, & Iqbal, 2024) (Ingale, Nandanwar, & Buva).

Furthermore, even in the presence of the use of AI and IoT devices, their performance is questionable regarding dependability and precision. This is because the algorithms in use in an AI system only function as well as the data sets on which it has been trained, and any normality that is contained in the data becomes reflected in the results. Likewise, IoT devices have to give reliable measurements to make healthcare decisions based on this data accurately. There is a desire for the use of AI & IoT in the healthcare sector, however, there is limited knowledge about its efficiency in primary care where family physicians act as the first point of contact for patients (Mikhailov, 2024) (Alshamrani, 2022).

The need for improved communication and exchanging of data by family physicians is another area where these technologies could be very useful, yet, the evidence in this area of practice is still rather small. Although a significant body of research has been dedicated to the application of AI and IoT to support clinical functions such as diagnostics, limited effort has been invested in utilizing AI and IoT to enhance doctor-patient communication. It is important to know how these technologies are used in their current forms, what interventions are facing, and the effect on communication to define the further role of such technologies in primary care (Maleki Varnosfaderani & Forouzanfar, 2024) (Alowais et al., 2023).

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

Literature Review

Significant attention has been paid in the recent literature to the combination of AI and IoT in healthcare. The above technological applications present opportunities for enriched ways of providing and accessing care, especially through communication between healthcare givers such as family physicians and users. With medicine transforming towards patient-oriented concepts, the role of AI and IoT in managing communication and sharing instant health data has become one of the biggest cybersecurity topics. This paper reviews the literature looking at the use of AI and IoT in communication within the healthcare domain, the use of AI applied in primary care communication, its effects on the relationship between patient-physician, and the prospects and challenges that arise from the same (Ranjan & Ch, 2024) (Jabarulla & Lee, 2021).

Artificial Intelligence in Communication in Healthcare

AI has quickly become one of the most vital technologies in healthcare and how it can improve the interactions between healthcare providers and patients. One of the principal areas of healthcare communication with the use of AI is virtual assistants and chatbots as patients do not interact with a physician directly. They can help ask and answer basic health questions, set appointments, report symptoms, and generally dispense advice through preset scripts or artificial intelligence. Recent research has also established that the use of AI-based chatbots will help lighten patients' load by attending to basic tasks so that doctors will be free to address more serious cases. This can, in turn, improve the effectiveness of care communication; particularly in primary care practices where physicians are involved with a large patient roster (Pulimamidi, 2024) (Lederman, Ben-Assuli, & Vo, 2021).

There are other areas in which AI can help better communication in the healthcare system such as its deployment in predictive analytics. Stochastic modes including patient risk factors and the nature of their illness, follow-up appointments, and the precautionary measures to be followed are also produced by large data set AI-trained models that foster proactive dialogue. For instance, Obermeyer et al. discovered that using AI algorithms could enable the identification of patients who were likely to be admitted to a hospital so that the healthcare provider can intervene early and communicate with the patient promptly. This is a great feature when it comes to chronic diseases


Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr


because effective handling of chronic diseases requires constant and timely communication with the patient (Vashishth et al., 2024) (Sudha, Ambhika, Maheswari, Girija, & Nalini, 2023).

Nonetheless, the literature also reveals some issues that AI has in healthcare communication. Another risk is algorithm bias because whenever AI models are trained on a prejudiced data pool, results that are impartial to all patients are unlikely to be achieved. For example, the existing AI models devoid of demographic sensitivity can yield less reliable suggestions for minors of colour, thus deepening health inequality. Additionally, it was found that, although AI can integrate into saving more time, it poses the risk of dehumanizing the practice of healthcare and consequently diminishing the quality of the patient-physician interaction. Introducing artificial intelligence in the communication process of the delivery of healthcare, as mentioned above, is all about striking the right and harmonizing person-centeredness with process efficiency (Katal, 2024) (Haleem, Javaid, Singh, & Suman, 2022).

IoT in Healthcare – Communication

The Internet of Things (IoT) has also grown rapidly, especially in terms of monitoring patients' health in real time. Smart devices like wrist-worn activity monitors, smart wristbands, and remote healthcare monitoring devices are beginning to be used in chronic illnesses and disease tracking. They allow patients to capture health information outside clinics and hospitals and relay it to doctors, which improves interaction and leads to early diagnosis. IoT devices are especially useful for conditions that need constant monitoring – diabetes, hypertension, heart issues, and others. For instance, Ghosh & Misra hold the opinion that the application of IOT devices for remote health monitoring can help reduce hospital readmission rates since the doctor from the hospital can monitor the patient's condition over a period and engage the patient depending on the progression of the symptoms (Li, Li, Wei, & Li, 2024) (Monteiro, França, Arthur, & Iano, 2021).

In the same vein, Kalid et al found that health monitoring that is facilitated by the IoT and wearable technology was likely to identify a decline in the health of an individual before the situation worsens hence implying that caregivers are likely to respond in time. These synchronous data exchanges enhance persistence and increase communication between patients and physicians, thus encouraging an engaging healthcare model. Besides enhancing the aspect of patient-physician


Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr


interaction, it can be seen that IoT devices help in patient enablement and enhance patient understanding. Using monitored data, patients can better participate in their healthcare decision-making process, since real-time data is available. The latter, as identified by Lupton, can enhance patients' compliance with recommended treatment and care since patients' autonomy is enhanced concerning their health determinations (Kadayat, Sharma, Agarwal, & Mohan, 2024) (Kelly, Campbell, Gong, & Scuffham, 2020).

However, to triangulate the above advantages, IoT's integration also comes with its weaknesses in the health sector's communication. This might be considered one of the biggest challenges, the problem of data privacy as well as its protection. HIO objects monitor patients' delicate health information and thus require security measures to guard against breaches and unauthorized access. The study carried out by Li et al. also reveals that strong cybersecurity should be developed to protect the personal information of patients, especially with the prevalence of IoT devices. Another challenge related to hacking vulnerabilities implies a threat to the major IoT goal to enter the healthcare industry where people's personal and medical data exposure is not something the majority would consider worthy of risks (Ramalingam, Pandian, & Batcha, 2024) (Dwivedi, Mehrotra, & Chandra, 2022).

The other issue is the Digital divide It's the difference between people with and without access to digital technologies. Firstly, IoT devices are comparatively costly and patients depend on a stable internet connection, which some patients especially those from rural areas may not have. So, the opportunities for IoT in the realm of healthcare being concerned with its communication may concern only such high-needs segments of the population as the rich or the ones who have access to the Internet and similar technologies, thus increasing health inequality. Van Dijk for instance revealed that the use of digital health technologies was highly dependent on the socioeconomic status of the individuals (Yigit et al., 2024) (Thakare, Khire, & Kumbhar, 2022).

Impact on Patient-Physician Relationships

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

By combining the application of artificial intelligence and the Internet of Things, there is a possibility to redefine the concept of the patient-physician relationship and shift the focus to the new paradigm of interpersonal communication. Occasionally, such technologies help to improve relationships since they make communication easier and more focused – this is because the decision-makers receive useful information upon which they make their decisions. However, the potential risk of a depersonalized healthcare experience that is dominated by AI and IoT technologies has concern among people (Rath et al., 2024) (Al-Jaroodi, Mohamed, & Abukhousa, 2020).

Many papers have been published concerning the effect of AI and IoT on patients' trust in physicians and other healthcare workers. Physician-patient trust is an essential foundation of healthcare delivery, and the current study ascertains that AI and IoT can increase or decrease trust in physicians depending on the design. For example, Esmaeilzadeh showed that if patients felt that AI was clear and if it was in line with the doctor's advice, then they would have more trust in it. Conversely, such patients might be less trusting the AI tools especially if they think that many decisions are being made with minimum supervision by humans (Zeb, Nizamullah, Abbasi, & Fahad, 2024) (Secundo, Shams, & Nucci, 2021).

In the same way, the integration of IoT devices in the healthcare communication system changes the extent of interaction of patients with their doctors. It is however argued by some researchers that since IoT is based on constant monitoring and sharing of data, there's the possibility of reducing physical touch-points between a patient and a physician. However, positive uses of IoT have pointed out that these devices can support face-to-face communication since they offer physicians a broader view of their patients' state, therefore, communication during appointments would be much more meaningful (Bora et al., 2024) (Singla, 2020).

Challenges and Opportunities

Despite the uncovering of the broad prospects of applying AI and IoT in the context of healthcare communication, the reviewed literature identified several issues that must be resolved to fully unlock the potential of this technology. Again, as pointed out earlier, data privacy and protection is a big issue currently, especially with the proliferation of IoT devices, which collect

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

health information. That is why it is so important that these technologies should also be secure and HIPAA compliant to get them used more widely. The last but not least significant AI and IoT challenge is technospeak or at least technoliteracy needed to make proper usage. Not only the patients but also the healthcare providers should effectively be trained in these technologies; in case of lack of training the enhanced value might not be achievable (Fahim, Kalinaki, & Shafik, 2024) (Shiwlani, Khan, Sherani, & Qayyum, 2023).

Based on the literature, it was realized that these technologies may be problematic for patient adoption, especially among the elderly, because most of them are not well acquainted with digital technology. This technological gap has to be closed to ensure that the population can be connected to AI and IoT. However, the literature also outlines large potential advantages. The connected use of both AI and IoT systems can enhance communication in healthcare organized via entities such as polarization, data, and efficiency. With these technologies advancing, the healthcare system can integrate them to provide better patient health, reduce the costs of healthcare, and provide the best experience to the patients. Challenges persisting at the current stage and leveraging the positive effects of AI and IoT involve the ways these technologies could be used as components of the healthcare communication infrastructure (Kaur & Sharma, 2024) (Salama, Al-Turjman, Chaudhary, & Yadav, 2023).

Research Methodology

The current paper uses a survey quantitative research approach to examine the use of AI and IoT in addressing the communication gap between family physicians and their patients. However, this research study aims to measure the effectiveness of these technologies on communication effectiveness, satisfaction, and health imperatives by use of quantitative research methods. It must also be noted that the study intends to employ a structured systematic approach to the collection and analysis of data hence ensuring the study yields reliable, valid, and generalized results that can apply to other different healthcare facilities (Khan et al.) (Haleem, Javaid, Singh, & Suman, 2021).

Research Design

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

The research on the other hand employs a cross-sectional survey design which is suitable in that it enables one to collect information from numerous individuals in one period only. The use of this design enables the researcher to capture the current experiences and opinions of patient and family physicians who have used AI and IoT in their conversations. In quantitative research, the variables can be measured more accurately than in qualitative research, and due to cross-sectional research, possible connections between the use of AI/IoT and communication outcomes can be determined without a longitudinal study (Abdo, 2024) (Bohr & Memarzadeh, 2020).

Population and Sampling

The target population for this study includes two primary groups: We considered two groups of participants: those with an AI and IoT-based communication experience as their family physicians and those actively employing AI and IoT technologies in their practice as family physicians. In the study, the researchers employed a non-probability technique of sample selection known as convenience sampling. Even though this study adopted convenience sampling which increases the study's bias, it is suitable since it targeted users with experience in applying AI & IoT in healthcare. The survey was completed by 250 participants, the majority of whom were patients but also some doctors. These participants were selected based on whether they have used AI tools in the form of chatbots virtual assistants or IoT devices such as wearables and remote health monitors for better Healthcare communication. Accordingly, the present number of participants is deemed adequate to perform a statistical analysis of the application of such technologies in healthcare facilities (Ali, Ali, & Ali, 2024) (Shah & Khang, 2023).

Data Collection

The main data collection tool employed in the present research is a structured questionnaire. The questionnaire was created to provide basic data comparing the frequency of usage of AI and IoT, their impact on communication with healthcare professionals, patients' enabling, and patients' overall satisfaction with the technologies. The questionnaire is comprised of closed questions which are appropriate for quantitative research only. Some of the data collected include using Likert scale questions, yes/no questions, and multiple choice questions to collect

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

diverse data about participants' experiences and attitudes (Siva, Sudha, Pooja, Maheswari, & Girija, 2024).

The survey was therefore administered online through email and different online survey sites to reach out to participants from different geographical locations. The choice to use an online mode of distribution was to ensure increased ways of response as well as touching on people who hopefully have encountered the online tools being used. The respondents didn't need to give their responses, participants were also told that their responses would be anonymous and would not be traced back to them (Saini, Ahuja, & Sai, 2024).

Variables

The core independent variables of this research are the usage of AI applications such as chatbots and virtual health assistants, and IoT technologies like wearable devices and remote patient monitoring systems. The dependent variables entail communication effectiveness, patient satisfaction, health outcome, and patient empowerment, the latter being measured by the extent of communication frequency, clarity, and accessibility. Further covariates for age, gender, and region as well as length of relationship with the physician were also incorporated into the model to remove any confounding influence on the collected data (Williamson & Prybutok, 2024).

Data Analysis

The responses collected were analyzed through descriptive and inferential statistical analysis with the help of statistical software. Frequency, means and standard deviation were used to describe the demographic information of the participant, the usage of AI and IoT, and the overall satisfaction level. It showed an initial glance at the features of the data and affirmed the possibility of the researcher detecting any sensible trends in the matter. To generalize and compare the results, infrequent chi-square tests were applied to compare categorical variables including AI/IoT usage with the patients' satisfaction level While regression analysis was used to evaluate the significance of AI, IoT instrument, and their effects on communication efficiency and health outcomes. By so doing it enables the study to uphold sound statistical testing, which in turn enables the study to reveal social relations and provide empirical evidence on communication and AI and IoT in the health sector (Rao & Sultana, 2024).

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

Ethical Considerations

The study was conducted to observe the rights of the participants who complied with a set of ethical standard procedures. All participants in the survey signed consent forms before they could be allowed to participate in the survey. The respondents' identity was not revealed as part of the research and no information relating to the respondents' identity was personally collected. Data were well-secured and only used in studies. The subjects were assured the right to participate in the study willingly and equally, they were told that they could refuse their participation and leave the study at any time and for any reason without any adverse consequences (Ullah, Khan, Ouaissa, Ouaissa, & El Hajjami, 2024).

Limitations

However, this type of research offers one strong framework for analyzing the effects of AI and IoT in healthcare communication. The convenience sampling method may also contribute to bias because the actual participating participants may not give the society's general feel. Furthermore, given the data collection method, this study may experience response bias, where respondents over or underestimate the use of AI and IoT tools (Alrashdi & Alqazzaz, 2024).

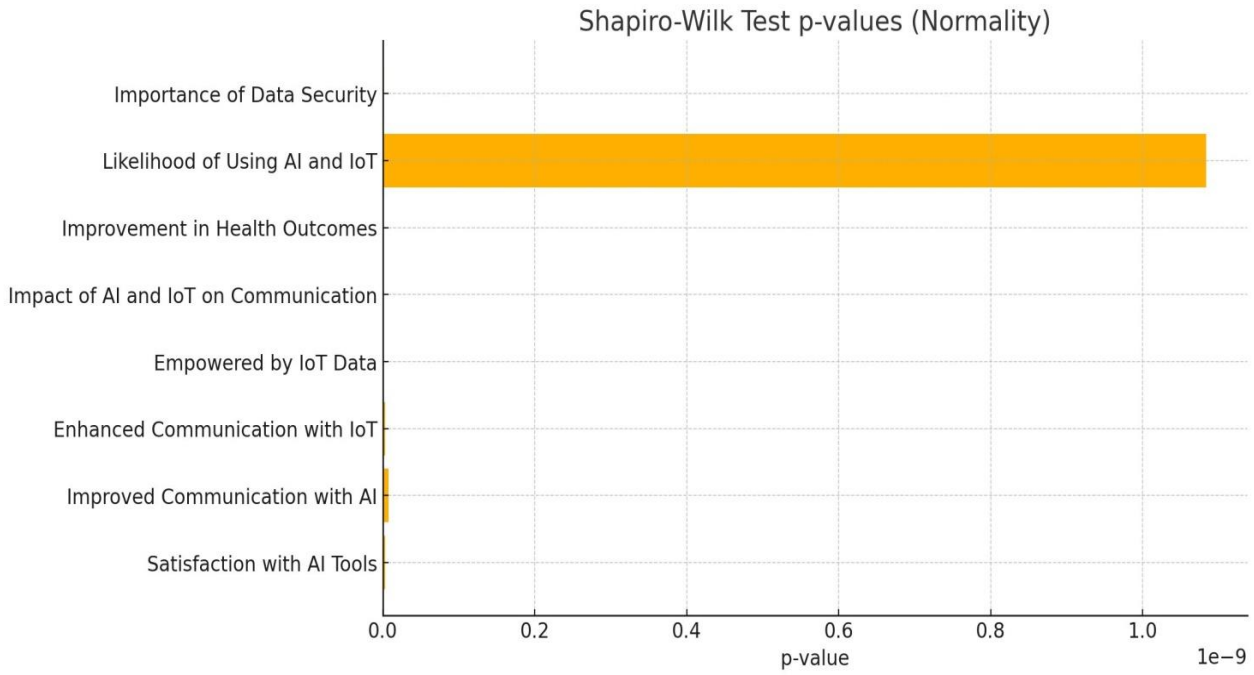
Data Analysis

Results of Statistical Tests

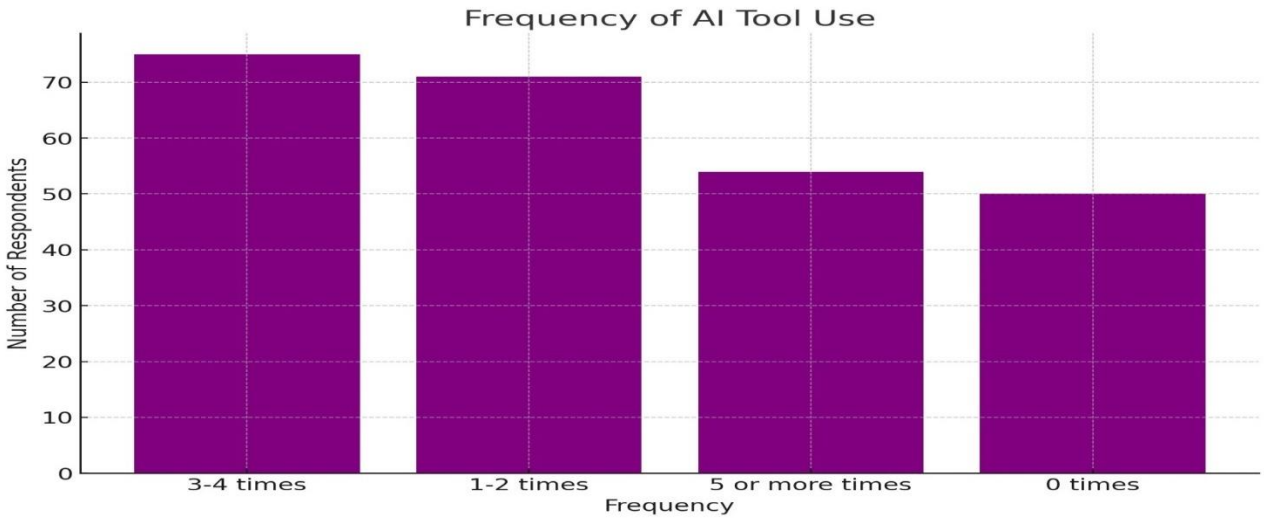
Test	**W-Statistic / Alpha / R-squared**	**p-value**
Shapiro-Wilk Test (Satisfaction with AI Tools)	0.8946	0.000
Shapiro-Wilk Test (Improved Communication with AI)	0.8995	0.000
Shapiro-Wilk Test (Enhanced Communication with IoT)	0.89354	0.000
Shapiro-Wilk Test (Empowered by IoT Data)	0.87112	0.0000
Shapiro-Wilk Test (Impact of AI and IoT on Communication)	0.86963	0.0000

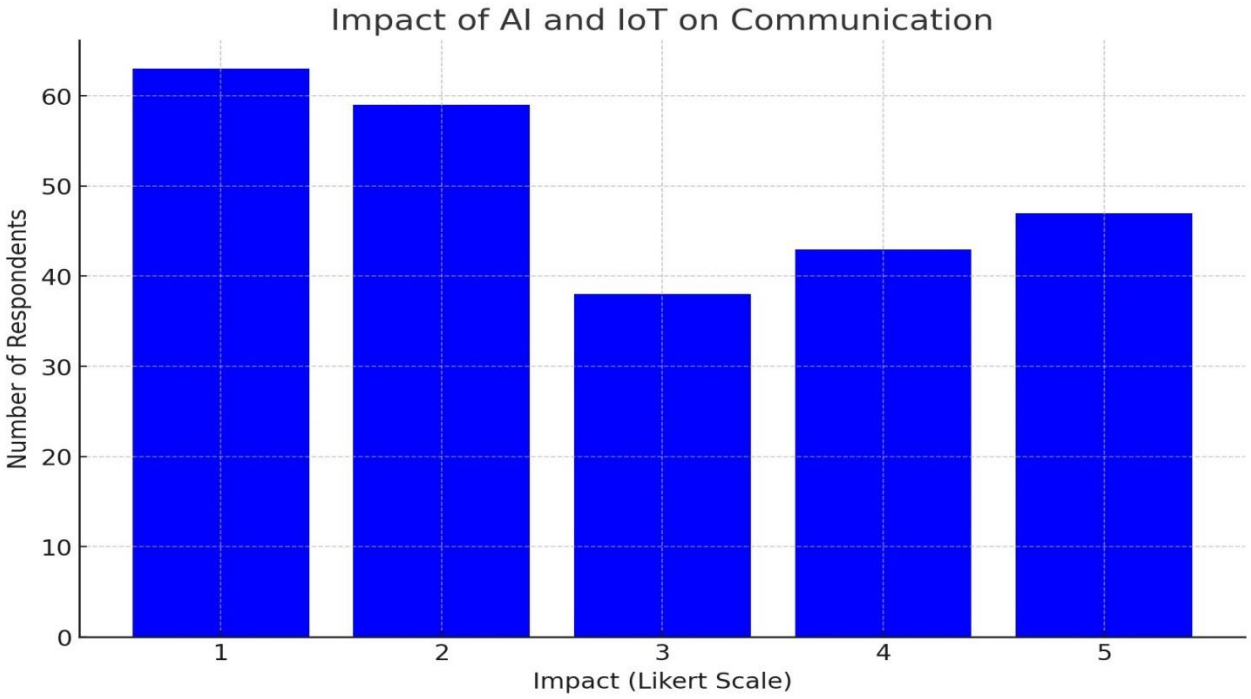
Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

Test	W-Statistic / Alpha / R-squared	p-value
Shapiro-Wilk Test (Improvement in Health Outcomes)	0.8818	0.0000
Shapiro-Wilk Test (Likelihood of Using AI and IoT)	0.9277	0.0000
Shapiro-Wilk Test (Importance of Data Security)	0.8900	0.0000
Cronbach's Alpha (AI & IoT Likert Scale Questions)	0.0404	N/A
R-squared (Regression on Communication Effectiveness)	0.0097	N/A

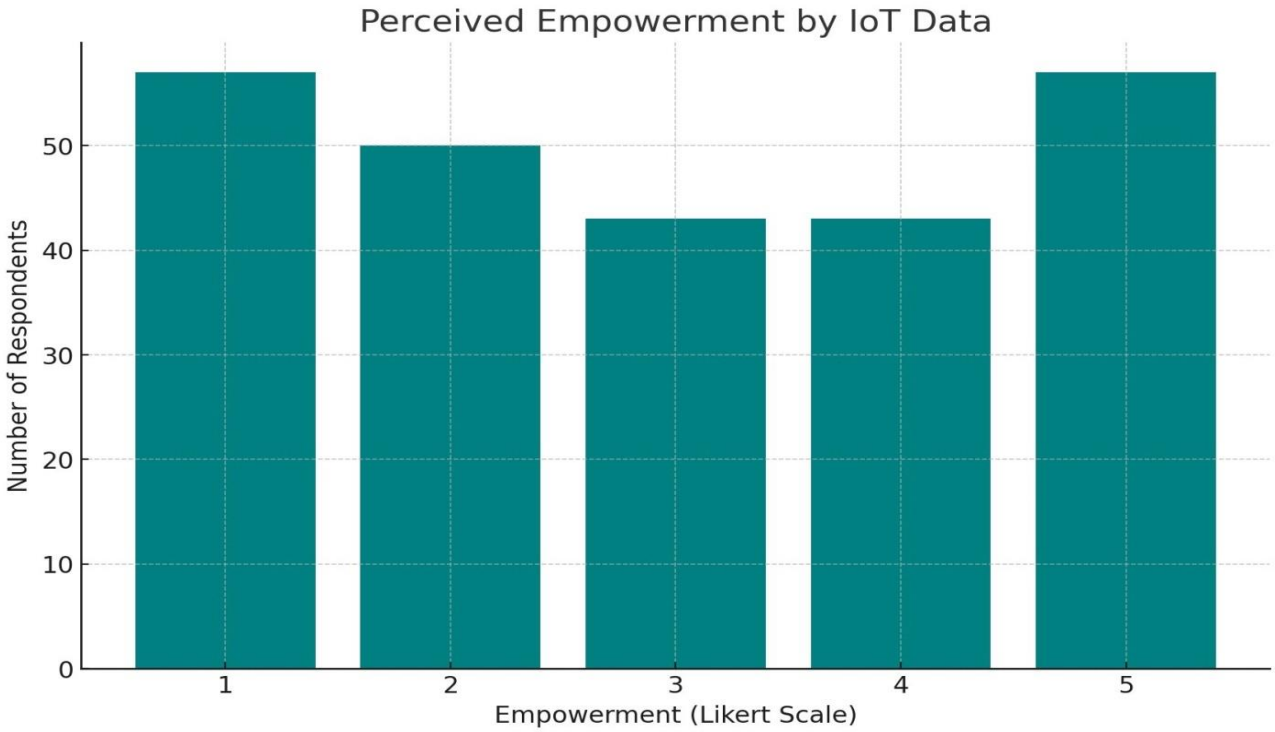


Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr





Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr



Interpretation of the Results

The quantitative research carried out on the implications of AI and IoT for work efficiency and organization of communication with the immediate superior or family physicians produced specific results from the statistical tests and graphs (Srinivasan, Rampur, Rao, & Singh, 2024).

Test of Normality (Shapiro-Wilk)

Hence, the descriptive analysis of the key variables such as “Satisfaction with AI Tools,” “Improved Communication with AI,” “Enhanced Communication with IoT,” and Other” showed that they were not normally distributed since $p < 0.05$ was less than 0.05. This also leads to the conclusion to use Non-parametric epsilon tests for the analysis as the distribution of data appears to be skewed (Pradeep, Kumari, Tyagi, & Tiwari, 2024).

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

Cronbach's Alpha Coefficient.

A preliminary assessment of the Likert-scale questions about the influence of AI and IoT on communication effectiveness was made based on Cronbach's Alpha coefficient, which equals 0.0404; this is far below the acceptable index of reliability that should not be lower than 0.7. These results reveal that there is low internal consistency between the items because they have a low Coefficient Alpha score. It may also mean that the respondents in some ways may not see the different aspects of AI and IoT tools in communication as interconnected and this can be influenced much by the variability of physical user experiences and expectations of those technologies (Alhur, 2024).

Regression Analysis (R-squared)

The regression analysis gave an R-square value of 0.0097 which implies that the four independent variables; satisfaction with the AI tools, better communication due to AI and IoT, and increased communication due to IoT account for the small variation of 1% of the dependent variable; the perceived impact of the use of AI and IoT on communication effectiveness. This implies that other variables outside the scope of the proposed model, including patient-physician relations, patient and/or practitioner conditions, or other characteristics of the technology, may exert significantly larger effects on communication (Ziadi, Fourati, & Saidane, 2024).

Charts Interpretation

1. **Frequency of AI Tool Use:** Self, Only a small percentage of the respondents use AI tools more often than once a week while the majority of the respondents use them once per week or less frequently. This pattern implies that although some AI tools are used in the healthcare system, they are not usually incorporated into regular healthcare practice (Sripathi & Leelavati, 2024).
2. **Impact of AI and IoT on Communication (Likert Scale):** Most of the participants scoring a Likert score of 3 considered the use of AI and IoT tools in communication as having a moderate impact on the effectiveness. This research gives the impression that these technologies are not instrumental in enhancing communication but are perceived as useful by a good number of respondents (Verma, Rao, Chapalamadugu, Tiwari, & Upadhyay, 2024).

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

3. Perceived Empowerment by IoT Data: The Likert results suggest that participants remember moderately feeling empowered by IoT tools – a score of 3-4 suggesting a positive but nonrevolutionary of health real-time monitoring devices on patients' self-health management (Mathkor et al., 2024).

Summary Metrics

The perceived satisfaction was rather neutral to slightly positive with the mean values for satisfaction with AI tools, with the impact of AI on communication, and with being empowered by IoT being 3 of 5. In the same vein, the mean. Persistency likelihood of the subject consumers towards AI and IoT instruments was 5.876 out of 10 which denotes that consumers are moderately inclined towards persistency to the use of these tools in healthcare but are not wholly committed to the consequential value of these tools (Putra et al., 2024).

Discussion

This study is significant as it establishes new knowledge on AI and IoT in meeting the existing role of Family Physicians in their communication with patients. Despite that, the current contribution of these technologies seems to be rather limited. The study presents some results: First, it highlighted that, while patient-level AI and IoT instruments are utilized, they are not commonly incorporated into healthcare interactions. A large percentage of respondents said they use AI tools now and then, which means that the technologies do not appear to be widely adopted as yet or may be adopted for narrower, more specific applications. This means that though helpful, AI and IoT applications have not further advanced enough to the extent that they are indispensable in interaction between patients and physicians (Singh, Singh, Verma, & Maurya, 2024).

Still, to an extent, the research established that there are benefits of AI and IoT in patient enablement not only through AI but also through IoT, such as wearable health tracking devices. Control: Smaller yet several participants clearly stated they felt more equipped to manage their health by these technologies, notwithstanding the moderate perceived level of change to communication. This implies that IoT tools especially can be valuable in helping patients get real-time information about their health to be more proactive about their status (Adru & Srijayanthi, 2024).

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

However, a few issues hinder the effective use of AI and IoT in healthcare communication. The Cronbach's Alpha value pointed to 0.682, which denotes that there was low internal consistency of the questions related to AI and IoT and variable in respondent experience. This could be attributable to the variations in the quality, variety, and usability of AI and IoT tools; or the absence of uniformity in the application of AI and IoT in healthcare facilities. These findings also suggested that there are factors beyond the AI and IoT variables that have a greater impact on communication effectiveness: for instance, patient-physician relations, the type of health issue in question, or trust in the application (Abatal et al., 2024).

In conclusion, even though both AI and IoT are prototyping the health communication environment, their current influence on the processes is still rather small. Instead, more attention should be paid to making better such tools in terms of their availability, usefulness, and efficiency. Training activities for the nurses and also the patients could assist reduce the divide in technological innovation and thereby allow them to be implemented into practice. Furthermore, future studies should consider the factors that would hinder wider acceptance of the model, factors that include data privacy and digital gap. With more investment put in these areas, AI and IoT are bound to become essential resources in enhancing communication as well as efficacy in healthcare (Tamilarasi, Hemalatha, Jothimani, & Ashokkumar, 2024).

Conclusion

The combination of AI and IoT in healthcare communication has the potential to bring benefits but this study shows us that the current influences it has is moderate at most. Though it provides real-time information exchange, recommendation systems, and patient engagement technologies have already made their presence felt, these technologies have not been popularized in day-to-day communication between FP and patients yet. The majority of the respondents reported they use AI and IoT tools sporadically and while they see some advantages in using these technologies they have not infused healthcare communication yet.

Among the more uplifting discoveries is the level of agency that IoT gadgets offer patients to take charge of their health. Although the effect size is not very high, the results suggest that AI and IoT tools are a small component of a large Healthcare System in which factors like the patient's

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

trust in a provider also play a vital part. The study also highlighted barriers; how differently such technologies are perceived and utilized across individuals or what is needed is more reliable and consistent use of such technologies. These barriers must be addressed if AI and IoT are to have a greater and longer-lasting impact.

The target is to enhance the usage of these tools, protect data, and provide more education and support for patients and doctors. In conclusion, although there are increased opportunities for improving communication in healthcare settings by utilizing AI and IoT more effort needs to be applied to accommodate this technology into usual practice. Thus, these technologies can potentially play a more important part in enhancing the facet of healthcare delivery and the relations between doctors and patients.

References

Abatal, A., Mzili, M., Mzili, T., Cherrat, K., Yassine, A., & Abualigah, L. (2024). Intelligent Interconnected Healthcare System: Integrating IoT and Big Data for Personalized Patient Care. *International Journal of Online & Biomedical Engineering*, *20*(11).

Abdo, K. W. (2024). The Role of Artificial Intelligence in Improving Healthcare Operations in Saudi Arabia: Analytical Study of Current and Future Systems. *Nanotechnology Perceptions*, 743–758-743–758.

Adru, S. L., & Srijayanthi, S. (2024). *Integrated AI-Driven Healthcare System: Predictive Diagnosis, Personalized Medical-Report Content Generation, and Physician Recommendation.* Paper presented at the 2024 2nd International Conference on Sustainable Computing and Smart Systems (ICSCSS).

Al-Jaroodi, J., Mohamed, N., & Abukhousa, E. (2020). Health 4.0: on the way to realizing the healthcare of the future. *IEEE Access*, *8*, 211189-211210.

Alhur, A. (2024). Redefining healthcare with artificial intelligence (AI): the contributions of ChatGPT, Gemini, and Co-pilot. *Cureus*, *16*(4).

Ali, U., Ali, S., & Ali, M. T. (2024). Synergies of AI and smart technology: Transforming cancer medicine, vaccine development, and patient care. *International Journal of Multidisciplinary Research and Growth Evaluation*.


Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr


Alowais, S. A., Alghamdi, S. S., Alsuhebany, N., Alqahtani, T., Alshaya, A. I., Almohareb, S. N., . . . Badreldin, H. A. (2023). Revolutionizing healthcare: the role of artificial intelligence in clinical practice. *BMC Medical Education*, *23*(1), 689.

Alrashdi, I., & Alqazzaz, A. (2024). Synergizing AI, IoT, and Blockchain for Diagnosing Pandemic Diseases in Smart Cities: Challenges and Opportunities. *Sustainable Machine Intelligence Journal*, *7*, (6): 1-28.

Alshamrani, M. (2022). IoT and artificial intelligence implementations for remote healthcare monitoring systems: A survey. *Journal of King Saud University-Computer and Information Sciences*, *34*(8), 4687-4701.

Aminizadeh, S., Heidari, A., Dehghan, M., Toumaj, S., Rezaei, M., Navimipour, N. J., . . . Unal, M. (2024). Opportunities and challenges of artificial intelligence and distributed systems to improve the quality of healthcare service. *Artificial Intelligence in Medicine*, *149*, 102779.

Bohr, A., & Memarzadeh, K. (2020). The rise of artificial intelligence in healthcare applications. In *Artificial Intelligence in Healthcare* (pp. 25-60): Elsevier.

Bora, S., Mhatre, M., Mhetre, S., Mirajkar, O., Methade, V., & Metha, C. (2024). *Streamlining Healthcare: An Efficient Health Records Management System.* Paper presented at the 2024 16th International Conference on Electronics, Computers and Artificial Intelligence (ECAI).

Dwivedi, R., Mehrotra, D., & Chandra, S. (2022). The potential of the Internet of Medical Things (IoMT) applications in building a smart healthcare system: A systematic review. *Journal of oral biology and craniofacial research*, *12*(2), 302-318.

Emadi, S. (2023). Revolutionizing Healthcare: The Role of the Internet of Things in the Field of Medical Engineering. *Future Generation of Communication and Internet of Things*, *2*(3), 1-5.

Fahim, K. E., Kalinaki, K., & Shafik, W. (2024). Electronic Devices in the Artificial Intelligence of the Internet of Medical Things (IoT). In *Handbook of Security and Privacy of AI-Enabled Healthcare Systems and Internet of Medical Things* (pp. 41-62): CRC Press.

Haleem, A., Javaid, M., Singh, R. P., & Suman, R. (2021). Telemedicine for healthcare: Capabilities, features, barriers, and applications. *Sensors International*, *2*, 100117.


Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr


Haleem, A., Javaid, M., Singh, R. P., & Suman, R. (2022). Medical 4.0 technologies for healthcare: Features, capabilities, and applications. *Internet of Things and Cyber-Physical Systems, 2*, 12-30.

Ingale, P. C., Nandanwar, S., & Buva, K. Enhancing Patient Care and Monitoring Using AI and IoT in Healthcare. In: Academic Press.

Jabarulla, M. Y., & Lee, H.-N. (2021). *A blockchain and artificial intelligence-based, patient-centric healthcare system for combating the COVID-19 pandemic: Opportunities and applications.* Paper presented at the Healthcare.

Kadayat, Y., Sharma, S., Agarwal, P., & Mohan, S. (2024). Internet-of-Things Enabled Smart Health Monitoring System Using AutoAI: A Graphical Tool of IBM Watson Studio. In *Communication Technologies and Security Challenges in IoT: Present and Future* (pp. 427-445): Springer.

Kalusivalingam, A. K., Sharma, A., Patel, N., & Singh, V. (2021). Enhancing Patient Care Through IoT-Enabled Remote Monitoring and AI-Driven Virtual Health Assistants: Implementing Machine Learning Algorithms and Natural Language Processing. *International Journal of AI and ML, 2*(3).

Katal, N. (2024). AI-Driven Healthcare Services and Infrastructure in Smart Cities. In *Smart Cities* (pp. 150-170): CRC Press.

Kaur, G., & Sharma, S. (2024). Innovative Technologies for Healthcare Service Productivity. In *Innovative Technologies for Increasing Service Productivity* (pp. 274-292): IGI Global.

Kelly, J. T., Campbell, K. L., Gong, E., & Scuffham, P. (2020). The Internet of Things: Impact and implications for health care delivery. *Journal of medical Internet research, 22*(11), e20135.

Khalifa, M., Albadawy, M., & Iqbal, U. (2024). Advancing clinical decision support: the role of artificial intelligence across six domains. *Computer Methods and Programs in Biomedicine Update*, 100142.

Khan, R., Ma, X., Taj, S., Hassan, H., Ullah, I., Alwabli, A., . . . Ullah, H. Bridging the Future: The Confluence of Internet of Things and Artificial Intelligence in Communication System. In *Future Communication Systems Using Artificial Intelligence, Internet of Things and Data Science* (pp. 30-54): CRC Press.


Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr


Kothamali, P. R., Srinivas, N., Mandaloju, N., & kumar Karne, V. (2023). Smart healthcare: Enhancing remote patient monitoring with AI and IoT. *Revista de Inteligencia Artificial en Medicina*, *14*(1), 113-146.

Lederman, R., Ben-Assuli, O., & Vo, T. H. (2021). The role of the Internet of Things in Healthcare in supporting clinicians and patients: A narrative review. *Health Policy and Technology*, *10*(3), 100552.

Li, Y.-H., Li, Y.-L., Wei, M.-Y., & Li, G.-Y. (2024). Innovation and challenges of artificial intelligence technology in personalized healthcare. *Scientific Reports*, *14*(1), 18994.

Maleki Varnosfaderani, S., & Forouzanfar, M. (2024). The role of AI in hospitals and clinics: transforming healthcare in the 21st century. *Bioengineering*, *11*(4), 337.

Mathkor, D. M., Mathkor, N., Bassfar, Z., Bantun, F., Slama, P., Ahmad, F., & Haque, S. (2024). Multirole of the Internet of medical things (IoMT) in biomedical systems for managing smart healthcare systems: An overview of current and future innovative trends. *Journal of infection and public health*.

Mikhailov, V. (2024). Revolutionizing Healthcare: The Use of Artificial Intelligence in Clinical Care. *International Journal of Advanced Engineering Technologies and Innovations*, *10*(2), 718-735.

Monteiro, A. C. B., França, R. P., Arthur, R., & Iano, Y. (2021). An overview of medical Internet of Things, artificial intelligence, and cloud computing employed in health care from a modern panorama. *The Fusion of Internet of Things, Artificial Intelligence, and Cloud Computing in Health Care*, 3-23.

Patil, S., & Shankar, H. (2023). Transforming healthcare: harnessing the power of AI in the modern era. *International Journal of Multidisciplinary Sciences and Arts*, *2*(1), 60-70.

Prabhod, K. J. (2024). The Role of Artificial Intelligence in Reducing Healthcare Costs and Improving Operational Efficiency. *Quarterly Journal of Emerging Technologies and Innovations*, *9*(2), 47-59.

Pradeep, M., Kumari, S., Tyagi, A. K., & Tiwari, S. (2024). Smart Hospital in Smart Cities. *Digital Twin and Blockchain for Smart Cities*, 579-603.


Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr


Pulimamidi, R. (2024). To enhance customer (or patient) experience based on IoT analytical study through technology (IT) transformation for E-healthcare. *Measurement: Sensors, 33*, 101087.

Putra, K. T., Arrayyan, A. Z., Hayati, N., Damarjati, C., Bakar, A., & Chen, H.-C. (2024). A Review on the Application of Internet of Medical Things in Wearable Personal Health Monitoring: A Cloud-Edge Artificial Intelligence Approach. *IEEE Access*.

Ramalingam, G. P., Pandian, D., & Batcha, C. F. S. (2024). IntelliCare: Integrating IoT and Machine Learning for Remote Patient Monitoring in Healthcare: A Comprehensive Framework. *Journal of Cognitive Human-Computer Interaction (JCHCI) Vol*, *7*(02), 50-59.

Rangasamy, S., Rajamohan, K., Basu, D., Menezes, K. J., & Chongder, A. (2024). Revolutionizing Healthcare with IoT: Connecting the Dots for Better Patient Outcomes. In *AI and IoT Technology and Applications for Smart Healthcare Systems* (pp. 204-223): Auerbach Publications.

Ranjan, R., & Ch, B. (2024). A comprehensive roadmap for transforming healthcare from hospital-centric to patient-centric through the healthcare Internet of Things (IoT). *Engineered Science, 30*, 1175.

Rao, T. V. N., & Sultana, S. T. (2024). Applications of IoT-Enabled Systems in Healthcare Industry. In *Internet of Things-Based Machine Learning in Healthcare* (pp. 147-165): Chapman and Hall/CRC.

Rath, K. C., Khang, A., Rath, S. K., Satapathy, N., Satapathy, S. K., & Kar, S. (2024). Artificial intelligence (AI)-enabled technology in medicine-advancing holistic healthcare monitoring and control systems. In *Computer Vision and AI-Integrated IoT Technologies in the Medical Ecosystem* (pp. 87-108): CRC Press.

Saini, P., Ahuja, R., & Sai, V. (2024). Wireless Sensor Networks and IoT Revolutionizing Healthcare: Advancements, Applications, and Future Directions. In *Emerging Technologies and the Application of WSN and IoT* (pp. 228-250): CRC Press.

Salama, R., Al-Turjman, F., Chaudhary, P., & Yadav, S. P. (2023). *(Benefits of Internet of Things (IoT) Applications in Health care-An Overview).* Paper presented at the 2023 International Conference on Computational Intelligence, Communication Technology and Networking (CICTN).

Sarella, P. N. K., & Mangam, V. T. (2024). AI-driven natural language processing in healthcare: transforming patient-provider communication. *Indian Journal of Pharmacy Practice*, *17*(1).


Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr


Secundo, G., Shams, S. R., & Nucci, F. (2021). Digital technologies and collective intelligence for healthcare ecosystem: Optimizing Internet of Things adoption for pandemic management. *Journal of Business Research, 131*, 563-572.

Shah, V., & Khang, A. (2023). Metaverse-enabling IoT technology for a futuristic healthcare system. In *Handbook of Research on AI-Based Technologies and Applications in the Era of the Metaverse* (pp. 165-173): IGI Global.

Shiwlani, A., Khan, M., Sherani, A. M. K., & Qayyum, M. U. (2023). Synergies of AI and Smart Technology: Revolutionizing Cancer Medicine, Vaccine Development, and Patient Care. *International Journal of Social, Humanities and Life Sciences, 1*(1), 10-18.

Singh, P. D., Singh, K. D., Verma, R., & Maurya, S. (2024). *Leveraging AI, IoT, Fog, and cloud computing for sustainable healthcare transformation.* Paper presented at the AIP Conference Proceedings.

Singla, S. (2020). AI and IoT in healthcare. *Internet of Things uses cases for the healthcare industry*, 1-23.

Siva, S. R., Sudha, K., Pooja, E., Maheswari, B., & Girija, P. (2024). Revolutionizing Healthcare Delivery: Applications and Impact of Cutting-Edge Technologies. *AI and IoT Technology and Applications for Smart Healthcare Systems*, 75-91.

Srinivasan, A., Rampur, V., Rao, M. M. S., & Singh, R. (2024). Implementation of IoT in Healthcare Barriers and Future Challenges. *Advances in Fuzzy-Based Internet of Medical Things (IoMT)*, 271-286.

Sripathi, M., & Leelavati, T. (2024). The Fourth Industrial Revolution: A paradigm shift in healthcare delivery and management. *Digital Transformation in Healthcare 5.0: Volume 1: IoT, AI and Digital Twin*, 67.

Sudha, K., Ambhika, C., Maheswari, B., Girija, P., & Nalini, M. (2023). AI and IoT Applications in Medical Domain Enhancing Healthcare Through Technology Integration. In *AI and IoT-Based Technologies for Precision Medicine* (pp. 280-294): IGI Global.

Tamilarasi, M., Hemalatha, S., Jothimani, K., & Ashokkumar, L. (2024). Existing Tools and Technologies in Biomedical and Healthcare Systems. In *Blockchain for Biomedical Research and Healthcare: Concept, Trends, and Future Implications* (pp. 17-49): Springer.

Thakare, V., Khire, G., & Kumbhar, M. (2022). Artificial intelligence (AI) and internet of things (IoT) in healthcare: Opportunities and challenges. *ECS Transactions, 107*(1), 7941.

Ullah, I., Khan, I. U., Ouaissa, M., Ouaissa, M., & El Hajjami, S. (2024). *Future Communication Systems Using Artificial Intelligence, Internet of Things and Data Science*: CRC Press.

Vashishth, T. K., Sharma, V., Kumar, B., Panwar, R., Sharma, K. K., & Chaudhary, S. (2024). AI-Integrated IoT in Healthcare Ecosystem: Opportunities, Challenges, and Future Directions. *AI and IoT Technology and Applications for Smart Healthcare Systems*, 37-54.

Verma, P., Rao, C. M., Chapalamadugu, P. K., Tiwari, R., & Upadhyay, S. (2024). Future of Electronic Healthcare Management: Blockchain and Artificial Intelligence Integration. In *Next-Generation Cybersecurity: AI, ML, and Blockchain* (pp. 179-218): Springer.

Waheed, M. A., & Liu, L. (2024). Perceptions of Family Physicians About Applying AI in Primary Health Care: Case Study From a Premier Health Care Organization. *JMIR AI, 3*, e40781.

Williamson, S. M., & Prybutok, V. (2024). Balancing privacy and progress: a review of privacy challenges, systemic oversight, and patient perceptions in AI-driven healthcare. *Applied Sciences, 14*(2), 675.

Yigit, Y., Duran, K., Moradpoor, N., Maglaras, L., Van Huynh, N., & Canberk, B. (2024). Machine Learning for Smart Healthcare Management Using IoT. In *IoT and ML for Information Management: A Smart Healthcare Perspective* (pp. 135-166): Springer.

Zeadally, S., & Bello, O. (2021). Harnessing the power of Internet of Things-based connectivity to improve healthcare. *Internet of Things*, *14*, 100074.

Zeb, S., Nizamullah, F., Abbasi, N., & Fahad, M. (2024). AI in Healthcare: Revolutionizing Diagnosis and Therapy. *International Journal of Multidisciplinary Sciences and Arts, 3*(3), 118-128.

Ziadi, F., Fourati, H., & Saidane, L. A. (2024). AI and IoT Uses, Challenges and Opportunities for e-Health: a review. *2024 International Wireless Communications and Mobile Computing (IWCMC)*, 873-878.