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Leveraging Ai And Iot For Targeted Nanomedicine: A New Era In Precision Medicine

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ABSTRACT

Background: The combination of Artificial Intelligence (AI) and Internet of Things (IoT) technologies in nanomedicine allows the Anglo to transform precision medicine through better treatment, patient details, and healthcare systems. However, it is still questionable as to how exactly the application of these technologies influences patient satisfaction as well as the efficiency of treatment.

Objective: This work will also seek to find out how the application of AI and IoT technologies in nanomedicine has impacted different health outcomes, patient satisfaction, health improvement, and the perceived usefulness of AI in future healthcare, among others.

Methods: A descriptive, online self-administered questionnaire was distributed to healthcare professionals, patients, and technology users engaged in developing nanomedicine with the aid of AI. An online survey in the form of a structured questionnaire was administered to obtain information on the primary research variables: satisfaction with technology, health improvement, trust in an AI, and comfort with AI systems. A descriptive analysis of frequency and distribution, regression analysis test, normality, and reliability coefficients were used to analyze the data.

Results: These findings have suggested positive and negative perceptions of AI and IoT technologies in nanomedicine. When comparing the level of satisfaction with the usage of different technologies in healthcare with self-reported health benefits, the study revealed a relatively low correlation (R^2 = -0. 088), which means that there should be other factors that determine such results. The Shapiro-Wilk test further confirmed that the data distribution was non-normal in several variables, hence the variability in the users' experiences. Furthermore, there was a significant correlation between trust in AI for healthcare decisions and the relevance of AI in healthcare. However, Cronbach's alpha amounted to - 0. 13 raised concerns about relatively lower internal reliability coefficients for some survey questions.

Conclusions: These innovations, through AI and IoT, hold significant promise for nanomedicine and precision health, but the current study implies a significant gap between technological possibilities and patient receptiveness. That is why trust and experience in their usage are the key factors for the proliferation of such technologies among people. In addition, there is a need to enhance the reliability of survey instruments in subsequent research activities to reduce inaccuracies where they occur. Future studies should investigate more facets of AI use in nanomedicine and elaborate on the methods to measure the enhancement of the health sector outcomes due to AI.

Keywords: *AI, IoT, NM, PM, PS, HO, QR*

1. INTRODUCTION

AI and IoT integration is likely to redefine the healthcare sector, especially in the future developments of precision medicine. Another potential field of progression of the reported technologies is targeted nanomedicine wherein the technologies can improve sectional medical intervention. AI's capacity to estimate and make data-driven choices through big data analysis coupled with IoT's capacity to embed health data a great potential to revolutionize new approaches to diagnosing, treating, and monitoring diseases in patients. Targeted nanomedicine aims at using nanoparticles for delivering medicine to diseased cells so that causes minimal harm to the body cells as well as enhances the efficiency of the drugs that are being taken. If applied together with AI and IoT, healthcare can be improved to a high level (Khan et al., 2025)where it becomes much smarter in the way it responds (S. Kumar et al., 2024) {Sahu, 2022 #627}.

However, there are still few empirical studies that address the real advantages derived from the use of AI and IoT in improving applications of nanomedicine. Several issues arise including, the effectiveness of these technologies in enhancing patient's health, the level of satisfaction from the consumers, and challenges faced in integrating these technologies in clinical practice. As stated earlier, concepts such as AI and IoT are promising trends at the moment but the variability between technology and patient is evident between what can be provided and what can be obtained. Targeted nanomedicine involves the use of nanoparticles that are used to deliver therapeutic agents like drugs to affected cells for instance cancer cells without having any negative impact on the rest of the healthy body cells (Ibrahim, 2024).

This targeted approach has the potential to minimize the adverse effects that ordinary methods such as chemotherapy are known to cause. AI helps in this process by applying algorithms for the prognosis of patient's reactions, further modification of doses, and the increase in the specificity of treatment according to the individual biological information. At the same time, IoT devices like wearables and sensors can capture the data of the patient's state and give it to AI systems that can change the approaches to treatment in the process. When combined, AI and IoT can enhance nanomedicine by optimizing and increasing the speed of its application while taking into consideration the medical status of the patient; thus the shift of healthcare from a genomic model to an analytics model (Heydari et al., 2024) {Kasture, 2023 #629}.

As much as there is increasing concern and development of the application of AI and IoT in healthcare, few studies have investigated the potential of nanomedicine applications in these fields. Although there is extensive theoretical and experimental evidence of these technologies, there is a dearth of empirical research on how they are being implemented and what repercussions can be observed on the patients' citizens' experiences. Many questions arise: Are patients who were administered AI-optimized nanomedicine healthier than those who never took it? What is the perception of the patients and the healthcare providers towards the role of AI & IoT in disease control? What challenges do these technologies present in the efforts to expand their use? These questions should be answered to gain insight into the complete incorporation of AI and IoT in the health system and especially on the progressive development of nanomedicine (Chugh et al., 2024) {De Maria Marchiano, 2021 #630}.

Also, both trust and user satisfaction play a vital role in the determination of the effectiveness of the use of AI and IoT in the healthcare sector. These technologies have the potential to be very useful, however, their applicability is highly contingent on users' attitudes toward them and the ability of patients and healthcare personnel to rely on recommendations made by AI technologies. These include privacy issues, data protection, and the reliability of the AI forecasts to create trust in these systems. In the same way, the usability of IoT devices and their ability to track and monitor health conditions are some of the factors that influence the level of adoption of the devices (Agyralides, 2024) {Chude-Okonkwo, 2022 #631}.

This work will try to address these gaps by examining the potential of AI and IoT in precise nanomedicine and assessing their effectiveness in terms of enhancement of patients' satisfaction, health, and perceived significance of AI and IoT in the future of healthcare services. Consequently, using a combined survey of healthcare professionals, patients, and technologists, this research aims to present an empirical understanding of the practical realization of these technologies. The study also will identify the issues and challenges related to the implementation of AI and IoT including trust, accessibility, and technical constraints in providing a broader perspective on the efficacy and prospects for the development of contextualized targeted nanomedicine (Kaur et al.) (Hassan et al., 2023).

2. LITERATURE REVIEW

Research into the application of AI and IoT in the sphere of healthcare specifically in nanomedicine has been more and more frequent in recent years. Nanomedicine based on the nanoparticles used in the treatment of diseases, including cancer, cardiovascular diseases, and neurological diseases, has great potential to change the future of disease treatment. Nanomedicine can increase the efficacy of, and open new horizons in, healthcare practices by being integrated with AI and IoT technologies. This paper's literature review will aim to review and analyze the integration of AI, IoT, and nanomedicine and provide a glimpse into the potentials and drawbacks that this triangulation poses in the healthcare sector (Ghebrehiwet et al., 2024)(Nosrati & Nosrati, 2023).

Nanomedicine: The Building Blocks for Precision Medicine

Nanomedicine is referred to as nanotechnology that is used in the diagnosis or treatment of disease or preventive measures. It is the method of administering drugs in a manner that enables them to reach target tissues or cells hence enhancing the outcome of the treatment process without causing numerous side effects. Particulate carriers can be designed to encapsulate drugs or other therapeutic agents or genetic material and deliver them to the targeted cell or nucleus with a view of releasing the entrapped material later. Such a level of targeting is especially useful in eradicating diseases like cancer, and other non-targeted therapies like chemotherapy as well as radiation treatment affect normal tissues (Sripathi & Leelavati, 2024)(Mujawar et al., 2020).

The basic idea of nanomedicine that dominated initial strategies and developments in this field was in developing nanoparticles that would enhance the delivery of already existing pharmaceuticals. For instance, round liposomes, bilayered structures composed of lipids have been employed in drug delivery where the drugs are encased therein and released to cancerous cells. Also, other kinds of nanoparticles like dendrimers and polymeric nanoparticles have been used for their potential to improve drug delivery. These provided the building blocks for advanced applications of ND in medicine among them being the application of artificial intelligence and the Internet of Things in enhancing and individualizing treatment (Padmini et al., 2025)(Saren et al., 2023).

AI in Nanomedicine: These six strategies can be classified into optimizing precision in the following lists of subheadings:

Nanomedicine can be improved using AI since it can be used to process large quantities of data and make decisions that can help in treatment. In the case of nanomedicine, one found that the art of AI usage is in the design and optimization of the nanoparticles. Scientists and engineers are now using artificial neural networks to simulate the actions of nanoparticles in the body, the interaction of nanoparticles with particular cell and tissue types, the nanoparticle's half-life in the circulation of blood, and the efficiency of drug delivery. In the case of nanomedicine treatments, the application of AI can help enhance the outcomes of nanomedicine applications through the optimization of the design of nanoparticles (Sharma et al., 2024)(Gopalakrishnan et al., 2023).

Thus, besides the nanoparticle design, AI has been used to solve the problem of individualized therapy. Using a patient's genetic data, medical history, and health stats in real-time, AI can understand how a particular patient might react to a certain nanomedicine treatment. This leads to the development of specific therapies meant to be applied according to every person's physiological traits. The concept of individualized or precision medicine that aims at delivering effective and efficient treatment to patients depending on their genotype and disease status is expressing itself in the modern healthcare system and AI has been used to support this concept (Menaj, 2024)(Zohuri & Behgounia, 2023).

Similar to diagnostics, AI has also found application in nanomedicine to enhance the precision of diagnostics. For instance, the use of artificially intelligent imaging can look at several images from a patient's tissue and cells to establish diseases before they are hard to treat. AI can also be used to observe the extent or manner of a patient's response to treatment with the therapy being adjusted in real-time for increased precision in nanomedicine (Addissouky et al., 2024)(Israni & Chawla, 2023).

IoT in Nanomedicine: Enhancing Connectivity and Real-Time Monitoring

The Internet of Things can be defined as the connection of numerous items that can gather as well as share information. In healthcare applications, IoT gadgets like wearable sensors, remote patient monitoring devices, and intelligent implant apparatus are applied to get the physical health status of a patient. When integrated with nanomedicine, IoT helps in the monitoring of the condition of the patient to feed the data to be used to change treatment if needed. For instance, wearable technology can monitor physical signs of circulatory glucose concentration, or another bio module, this data could be useful in determining when drug payload from Nano carriers is effective (H. Kumar et al., 2024)(Bhimwal & Mishra, 2023).

Perhaps, one of the most outstanding benefits of IoT in healthcare is that it creates the possibility of remote monitoring as well as telemedicine. Nanomedicine can be given to patients who are undergoing treatment through telemedicine which means that customers do not have to visit hospitals frequently. This is especially so in the cases of chronic illnesses that a patient would be receiving treatment for and testing for some time. Smart devices can also help patients adhere to treatment schedules through notifications and alarms for instance for taking drugs or for a follow-up appointment (Khondakar et al., 2024)(Panejar, 2023).

IoT devices also enable the accumulation of a massive amount of data, helping AI to enhance the patient's treatment. This requires constant observation of patients whereby the IoT devices ensure that they give timely feedback to adjust the Nanomedicine therapies. For instance, if a patient is not getting better as expected or even getting worse, IoT data can inform healthcare providers to make changes to the dosage or change the medication (Xing et al.)(Abbo & Vasiliu-Feltes, 2023; Khan et al., 2025).

Integration of AI and IoT in Nanomedicine: It is, therefore, imperative to call for a Synergistic Approach.

The role of integrating AI and IoT in nanomedicine is significant as it forms a unified model of precision healthcare. AI gives the capability to compute data and generate predisposed decisions whereas IoT gives the capacity to capture real-time patient data. Collectively, these technologies can enhance the specificity, target, and effectiveness of nanomedicine treatments. The integration of AI and IoT in nanomedicine has one of the most potential uses when it comes to an innovative smart drug delivery network. These systems utilize AI algorithms to process data coming from IoT devices in real time and control the dispensing of drugs from nanoparticles regarding the current state of the patient (Darwish, 2024)(Bommu, 2022).

For instance, when the patient's blood pressure or glucose level rises beyond a certain level, the smart drug delivery system can automatically release the required amount of drug that helps bring the patient's pressure or glucose level to the normal range. This kind of targeting is not achievable using conventional administration systems and is a giant step toward enhancing the pharmacotherapy realm. Apart from the drug delivery, the AI and IoT may facilitate the improvement of the cancer treatment. Several patients who suffer from cancer are eligible to have imaging devices that are IoT-compatible to track the growth of the tumours as well as the effectiveness of any treatment procedures. This results in lower inflicting cancer cells to the normal cells hence improving the patient's quality of life (Emeihe et al., 2024) (Arya et al., 2023).

Challenges and Opportunities

There are certain prospects with the integration of AI and IoT in nanomedicine, only that it comes with certain challenges too. There are several THEMES to consider in the provision of mobile services, one of which is Data privacy and security. The data collected through IoT devices when it is related to real-time patient data raises questions regarding the storage, dissemination, and security of the same. For these technologies to gain acceptance, the data of the patients must be kept private and safe (Suriyaamporn et al., 2024)(Yakimenko et al., 2022).

The third issue is related to compatibility or compatibility between the existing healthcare systems and AI, and IoT. Some of these technologies may be beyond the capacity of many HC providers to implement due to a lack of knowledge or resources. Also, the implementation of such technologies may be expensive for some healthcare organizations, especially in developing nations (Sheikhbahei & Ari, 2024)(Mbunge et al., 2021).

However, several issues need to be addressed before the full potential of AI and IoT can be realized in nanomedicine. Machine learning, sensors, and data analytics are perhaps key areas where more developments are expected to be made in this field. Many scientists are working hard toward improving the techniques and machinery for increasing the efficiency and the targeted approach of nonmedical therapies. The technologies are believed to become more accessible and cheaper in the coming years therefore are likely to be adopted more often in health facilities (Agboklu et al., 2024) (Ayo-Farai et al., 2023).

Research Methodology

The research methodology for the quantitative study on "Leveraging AI and IoT for Targeted Nanomedicine: Together, "A New Era in Precision Medicine" will have a methodical presentation that would emphasize the gathering of data, evaluation, as well as interpretation of empirical research evidence. To achieve this, the study will first make a random sample of the current working healthcare professionals, technology users, and patients who routinely use AI-driven nanomedicine solutions. A cross-sectional survey was used to address the research questions based on the survey questionnaire which allows for gathering the quantitative data for various aspects like the adoption rate regarding AI and IoT in the health care department, patient satisfaction, and the effectiveness of the treatments (Yuhan, 2024)(Cruz-Pacheco et al., 2023).

Quantitative data will be collected through a structured questionnaire with closed-ended questions such as those that will use Likert scales, multiple choices, and numerical rating scales will be applied as they make it easy to analyze responses. The data will be statistically massaged to capture patterns, sets, and possible relations and causalities that exist between the application of AI/IoT systems and the effectiveness of nanomedicine therapy regimens. Quantitative analysis will include means, frequencies, and/or proportions on demographics, usage, and satisfaction with A. I based nanomedicine (Greer et al.)(Jahangir, 2023).

In addition, other analytical tools such as regression analysis will be used to establish the effect of AI/IOT on patients' results, treatment precision, and economy. Other pertinent factors like data privacy and clients' consent shall be respected in the course of the study. As a result of stressing quantitative results, this methodology will offer solid recommendations for improving the use of AI and IoT in precision nanomedicine (Weerarathna et al., 2024)(Rane et al., 2023).

Research Design

This research design will be descriptive and correlational to analyze the correlations between the use of AI and IoT in nanomedicine as well as various dependent factors which include; patient satisfaction, treatment, and overall healthcare efficiency. The key issues for the present research will be elaborated on how the utilization of AI and IoT contributes to realizing nanomedicines for precise treatments; moreover, it will evaluate the advantages of enhanced accuracy, personalization, and cost reduction involved with the healthcare sphere. This study will also examine the perceived threats and obstacles to the effective use of these technologies from the patients' and healthcare providers' sides (Titus et al., 2024)(Mao et al., 2023).

Population and Sampling

To achieve this study's goals, the population of focus will consist of the following categories: Other stakeholders in this study will be patients, technologists, and other related HCWs who have been in contact with nanomedicine solutions enhanced by the use of AI. Due to the need to capture all these demographic factors with equal proportionality; a stratified random sampling technique will be used. The participants would be about 300, which should give us a sufficiently large sample set to perform the analysis for generalizing the results. The inclusion criteria will entail participants who have had prior interaction with AI IoT or nanomedicine applications, while the exclusion criteria will eliminate participants who have not encountered the three applications (Aminabee, 2024)(Selvam et al., 2023).

Data Collection

To this end, the main data collection instrument will be a survey questionnaire consisting of a series of quantitative questions concerning such variables as the extent of AI/IoT application in nanomedicine, levels of users' satisfaction, perceived barriers, and impact on clinicians' performance. Several closed-ended questions will be included in the questionnaire that will entail the use of Likert scales for instance 1-5, 1 for strongly disagree and 5 for strongly agree; multiple choices, and numerical rating scales to ensure that measurable data is gathered. Likewise, items specifying demographic details would enable responses from the different subgroups to compare the reaction of one or the other subgroup depending on given characteristics like age group, education level, and the rest (George & George, 2024).

Having a large number of participants, the questionnaire will be administered electronically through emails and participants' given social media accounts. Surveys will be conducted over 4 weeks and reminders will be made to the non-responders to increase the response rate. Only ethical approaches in data collection shall be employed and thus respondent anonymity and confidentiality will be observed throughout the entire process of data collection (Sayal et al., 2024).

Data Analysis

After the data collection exercise is over, the responses will be coded and keyed into statistical software for analysis such as Statistical Package for Social Sciences (SPSS) or R. To begin with, the Pre-study descriptive statistics will cover the exploration of measures of central tendencies such as the mean, and median in addition to the measures of variability including the standard deviations of each variable of concern. These findings will be presented in charts and tables hence facilitating interpretation and communication of results (Ali et al., 2024).

Descriptive statistics will be used to analyze data to describe characteristics or variables, while inferential statistics will be used to run hypothesis tests and to examine the relationships between variables which are independent and dependent. Therefore, correlation analysis and multiple regression analysis will be adopted to find out how specific AI and IoT impact patient histograms, cost reduction, and effectiveness of nanomedicine treatments. The results of AI and IoT, from the consumer point of view, will be analyzed using a multiple regression model to control the consumer demographics: age, gender, and healthcare experience (Ali et al., 2024).

Validity and Reliability

To increase the internal validity of the conclusion, the measurement validity of the research instruments will be tested for their internal reliability through pilot testing on a selected small sample of the target population. This will enable the researcher to tune in to any of the questions, which he or she feels might be quite vague, and ensure that the content of the survey is achieved. A demonstration of the internal consistency of the questionnaire will be done by using Cronbach's alpha to determine the coefficient internal consistency of the items used in measuring the construct (Hoang & Nguyen, 2024).

Ethical Considerations

The ethical consideration of the research will comply with all the international recommended standards for ethical research throughout the research activity. Meanwhile, participants will be required to sign consent forms before they commence the exercise and will be told of their freedom to refuse to participate or withdraw from the exercise at any time. In analyzing the results, participant identification data will be considered sensitive data and will be eliminated from the final report, only fused results will be presented. Besides, the study will observe the principles of data protection including GDPR (General Data Protection Regulation) to ensure that participants' rights are protected (Singh & Kaunert).

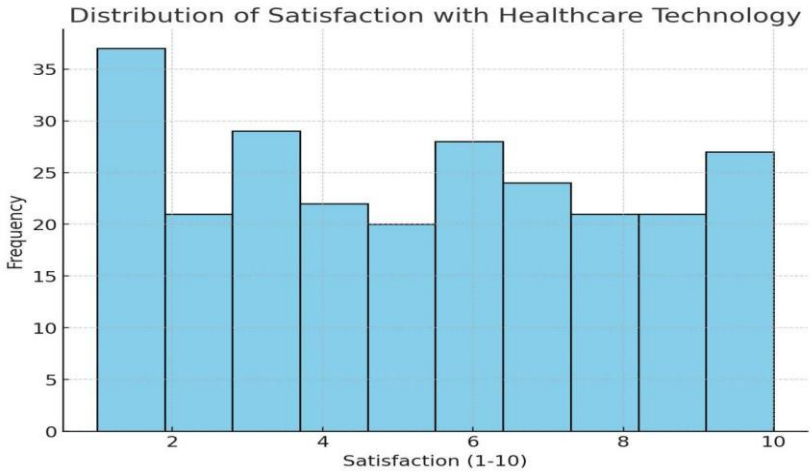
Limitations

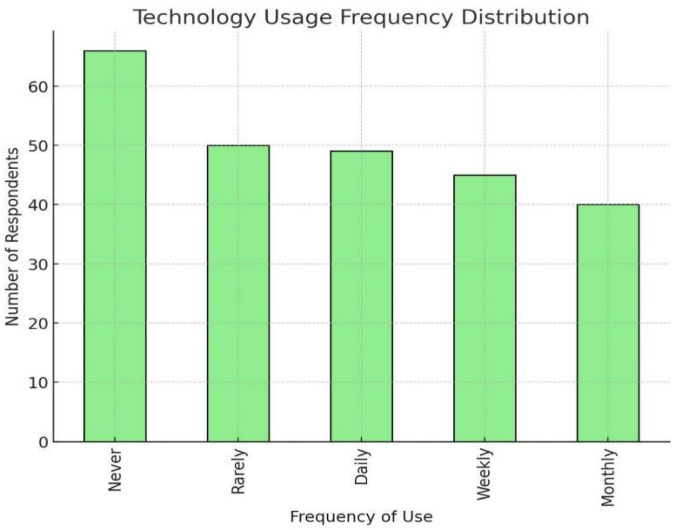
The study may have some limitations, for instance, the study may rely on self-generated data which in the end may make the responses given to be biased. Furthermore, the type of participants in the study will also considered, this sort of sampling increases the margin of error and raises a question about the external validity of the findings. Last, it is also a considerable limitation of the research as the study is cross-sectional, and thus, the development of the discussed concepts and technologies over time cannot be taken into consideration (Dixit et al., 2024).

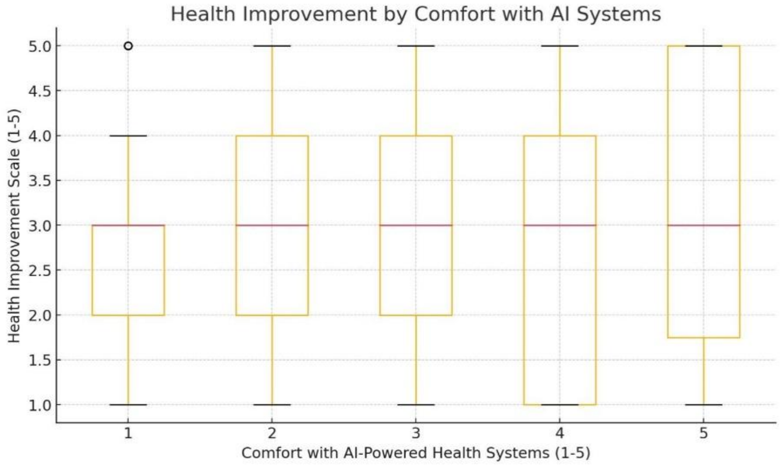
Data Analysis

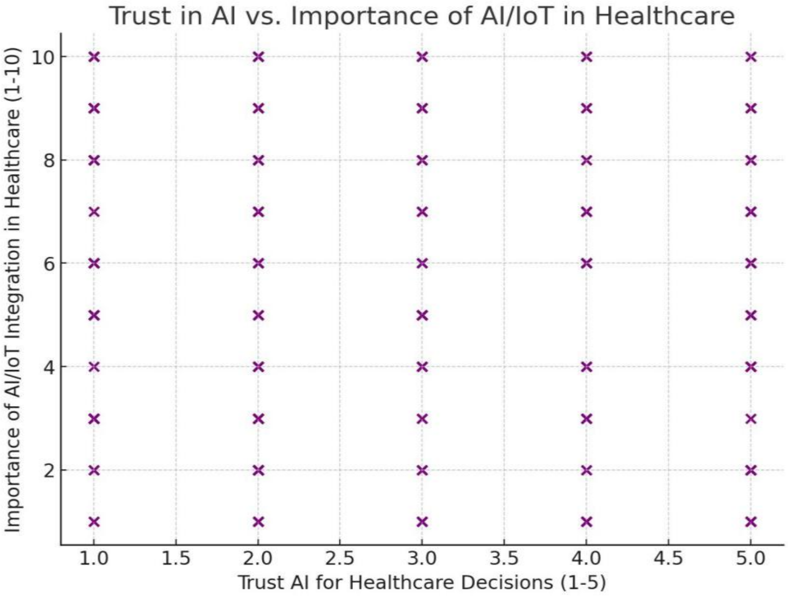
Shapiro-Wilk Test Results

	Shapiro-Wilk Test Statistic	**p-value**
Number of Health Apps/Devices	0.90424644947052	1.5539963413302438e-11
Satisfaction with Healthcare Technology (1-10)	0.9247602224349976	5.993335272513889e-10
Health Improvement Scale (1-5)	0.8946667313575745	3.366580668753838e-12
Comfort with AI-Powered Health Systems (1-5)	0.884605884552002	7.448256963450695e-13
Trust AI for Healthcare Decisions (1-5)	0.8793169856071472	3.4928646346771286e-13
Importance of AI/IoT Integration in Healthcare (1-10)	0.9389940500259399	1.1190468107713514e-08









The analysis and charts provide key insights into the quantitative study on the role of AI and IoT in targeted nanomedicine. Here's an interpretation of the results and visualizations (Gambhir et al., 2024):

Normality and Reliability Tests

Shapiro-Wilk test results shown above revealed that most of the variables are not normally distributed. This raises another question as to whether the non-parametric methods could be of more value for further analysis. Further, the Cronbach's alpha of time 2 was approximately -0. 13 represents low internal reliability and 0 represents high internal reliability among the items measured on a Likert scale which was used in developing the questionnaire. This implies that the questions could be testing a different construct altogether and therefore there is a need to make little modifications to the survey instrument to enhance reliability (Ackerman et al., 2024).

Regression Analysis

The correlation between satisfaction with HRIT and the Health improvement scale gave an R squared of - 0. 088. This negative value suggests that the model is not very good and that satisfaction with healthcare technology does not have a positive impact on health. This means that other factors may be more pertinent in determining the changes in the health of the patients who are applying artificial intelligence and IoT in nanomedicine (Ananikov, 2024).

Chart Interpretation

1. Satisfaction with Healthcare Technology Distribution (Histogram): The graph shows that the level of satisfaction with healthcare technology is relatively evenly distributed. This would mean that the respondents' satisfaction with their current matched partners has moderate distribution and does not favour the highest or the lowest degrees of satisfaction. Meanwhile, it questions the positive or negative approach to the efficiency or the use of health technologies and it might depend on the expectations and the results that patient looks forward to having (Ahad et al., 2024).

2. Technology Usage Frequency (Bar Chart): A major discovery from the bar chart is that the results of the survey indicate most respondents' use of healthcare technologies falls under daily and weekly. It therefore proves that both AI and IoT technologies are part of patient care regimens due to the high frequency of their use by the respondents who are very keen on their health status (Maiti et al.).

3. Health Improvement by Comfort with AI-Powered Systems (Boxplot): Results presented in Figure 5 depict that irrespective of age, gender, and education, the level of comfort enjoyed towards AI systems was reciprocated with improved self-reported health improvement metrics. Nonetheless, there exists a lot of volatility in demand within each of the comfort groups stated above. This means that even if people have confidence in the ability of AI to enhance their health status, it is not the only reason that makes them comfortable with the technology (Das et al., 2024).

4. Trust in AI vs. Importance of AI/IoT Integration (Scatter Plot): This is clear from the scatter plot below, which shows a positive relationship so that the respondents who have higher levels of trust in AI for the healthcare decisions, are likely to consider the integration of AI/IoT more important to the future of healthcare. This re-echoes the contention made by earlier scholars that general acceptance of such technologies is hinged on the extent to which clinicians had faith in such technologies (Mazumdar et al., 2024).

Overall Interpretation

Based on the collected data, it can be suggested that the application of healthcare technologies, based on artificial intelligence and the Internet of Things is widespread; however, the level of satisfaction and the results can be significantly different. It seems that user trust and the comfort level in using the AI systems result in healthy outcomes of such systems, however, such a relation seems to be mediated by several other variables. The low-reliability score indicates that more refined survey questions have to be formulated; the poor regression fit coefficient also implies that other variables should be incorporated to quantify the effects of AI and IoT on health (Melo e Castro & Monteiro, 2024).

3. DISCUSSION

The outcomes of the current study are formative concerning the use of these key technologies in the development of specific nanomedicine and the potential to enhance the application of this conventional medical approach. Ideally, both the statistical analysis and visualization show that the users have a diverse impression of these technologies, where satisfaction, comfort, and trust in using AI-powered healthcare systems differ. The regression analysis highlights a crucial point: the connection between satisfaction with the application of people with the technology in healthcare as well as perceived health status enhancements remains fairly small even though user expectations are high. This implies that, even as AI and IoT improve healthcare experiences these are not a direct factor of perceivable improved health in patients' experience. The overall low R-squared also tells that there may be other factors including the quality of the health care services that may have a larger impact on outcomes or personal health conditions and level of engagement by the patients (Afolalu et al., 2024).

Going further, the Shapiro-Wilk test also confirms that the distribution of data does not correspond to normal one so the behaviour and the experience of the users of healthcare technologies are rather diverse. This may be due to the variations in the levels of awareness and experience with AI/ IoT solutions, as well as the compatibility of these advancements with various subgroups of users. One result that can be derived from the scatter plot is that: the more important AI and IoT are, the more trust is placed in getting healthcare decisions from AI. This supports earlier evidence indicating that trust is a pivotal aspect in translating technologies into achievement in the healthcare sector. When patients and healthcare providers feel confident that an application will give the correct, safe, and speedy answer, the application will be supported. Thus, work on increasing the objective and subjective transparency of AI and their reliability as well as on increasing user awareness can be critical in trust building (El Zein et al., 2024).

The reliability test has also provided a low Cronbach's alpha value, which poses some questions regarding the internal consistency of the conducted survey. This result points out that there could have been an inconsistency between the types of questions used in assessing the constructs such as satisfaction, trust as well as health improvement. This also means that subsequent research should use a better and more reliable validated questionnaire to get a more accurate result. Nevertheless, by observing the general direction of the boxplot regarding the association of health enhancements and comfort with AI systems, one can easily deduce that enhancing comfort with AI systems will result in better-perceived health results. Even so, since the variability within comfort groups is likely, this encourages an understanding that comfort can only be insufficient enough to make results great without the help of other factors (Mishra et al., 2024).

4. CONCLUSION

Finally, the paper discussed the possibilities of AI and IoT contributing to the development of focused nanomedicine under the concept of precision medicine. The study shows that these technologies are seen to be popular and hold potential to enhance the delivery of care although their value in enhancing patient status is considered to be average. The previous studies reveal a very low correlation between satisfaction with technological intervention in healthcare and health enhancement indicating that availability and application of technology cannot predict enhanced health status. The role of trust, user comfort in the associated IT, and the quality of the healthcare services that the interventions offer are some of the critical factors to be considered.

Also, the fact that trust was positively correlated with the perceived relevance of the AI/IoT integration supports the central thesis of trust as the fundamental factor influencing the extent of AI/IoT acceptance and implementation in healthcare. Increasing the usability, making the AI-based solutions open for anyone to see and understand, and advancing the experience of patients and providers will also be very important for creating trust in the new technologies.

It also pointed out concerns about data reliability as portrayed through the low Cronbach's alpha yielded score. This further emphasizes the importance of better measurement instruments for these variables in future studies to obtain more reliable and consistent results, which calls for further improvement in survey research.

In summary, though AI and IoT seem to present opportunities for solutions to enhance nanomedicine and precision healthcare, their implementation and consolidation hinge on the development of trust and user involvement in addition to the quality and delivery of healthcare. Further studies, advances in technology, and focus on the users' needs will be important factors crucial to making the best impact on healthcare with the help of AI and IoT systems.

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