

AWARENESS AND UTILIZATION OF ARTIFICIAL INTELLIGENCE (AI) FOR HEALTHCARE PRACTICES AMONG HEALTHCARE PROFESSIONALS IN ENUGU STATE, SOUTHEAST, NIGERIA

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Abstract

The core of this article is on the awareness and utilization of artificial intelligence (AI) for healthcare practices among Healthcare professionals in Enugu State, Southeast, Nigeria. AI in health is still rudimentary and the study seeks to find out how aware and utilized it is among healthcare professionals in Enugu State, Nigeria. The theoretical framework used for this study is the diffusion of innovation theory. The theory explains how a new idea, product, or service spreads throughout a population. The innovation is concentrated to a few early users and spreads across time as knowledge and use of the innovation builds. The survey research method was used to elicit relevant data from 310 healthcare professionals from two selected hospitals in Enugu State. Thereafter, the data derived from the questionnaire were analyzed using simple frequency tables and percentages. The primary objective of the study was to ascertain the awareness and utilization of artificial intelligence for health care practices among health care professionals in Enugu state, south east Nigeria. At the end of the study, it was discovered that the health workers used for the study are aware of the use of artificial intelligence in medical practice but do not utilize it properly. The study recommended that health professionals should adopt the use of artificial intelligence in medical practice for better results.

Keywords: Awareness, Utilization, Artificial intelligence, Machine learning, Healthcare, Medical, Professionals, Nigeria.

Introduction

Artificial Intelligence (AI) in healthcare is a new phenomenon. Research is ongoing to discover how AI can be applied in various areas of the medical profession. AI in healthcare is machine learning that transcends human abilities and competence to reproduce human cognitive abilities in studying, presenting, and understanding complex health and medical data. AI do these through machine learning algorithms. The primary difference between AI technology and conventional technologies in healthcare is in the gathering of large and complex medical data, processing it, and producing a comprehensive and exhaustive output to the final user. AI algorithms can also be used to analyze complex and large amounts of data through electronic health records for disease prevention and diagnosis. Medical institutions such as The Mayo Clinic and the British National Health Service have developed AI algorithms for their departments. Large technology companies such as IBM and Google

have also developed AI algorithms for healthcare.

Examples of health practices where AI programs are applied include diagnostics, drug development, personalized medicine, and patient care. “The potentials for artificial intelligence in healthcare are numerous, given that it can also be applied in areas such as drug discovery and development, innovative treatment design, and the identification of drug therapy problems” Holzinger et al. (2019).

Davenport & Kalakota, (2019) “With the help of artificial intelligence and further advancement in technology, treatment and diagnosis of diseases will be much easier and cost effective.” Artificial intelligence is used to detect a disease before it becomes worse so that it could be cured easily in advance. AI and machine learning are used for the diagnosis of deadly disease such as diabetes before it becomes too late. Patients’ mental and physical condition will be diagnosed easily through

artificial intelligence. Administrative work in hospitals will also be easily carried out through artificial intelligence. All payment transaction will be easily paid and managed.

However, close attention should be paid concerning ethical issues surrounding practices such as data privacy and representation bias. Sharma (2018) “with advancement in technology and science many things have become good to society and many things are becoming harmful. As many hospitals are now maintaining the patient medical records online they are becoming more prone to cyber theft. So one of the major problems faced by healthcare industry is cyber security. Patients medical records are breached which is very precious for their health.” Patients’ confidential information and patients’ privacy are at risk of being is also violated and exposed if there are cases of a breach in data.

Due to the increase in life expectancy, artificial intelligence could be useful in taking care of older populations. Certain tools such as environment and personal sensors can identify an older person's regular activities and alert a caretaker if a patient requires medical attention. Although the technology is useful, there are also discussions about placing a limit in monitoring a patient in order to respect a person's privacy.

“Artificial intelligence refers to the various processes involved in the programming of machines that enable them to act like humans and mimic their actions. These activities may include carrying out tasks, processing information, and making decisions based on past events” Mahomed (2018). “According to technological advancements, artificial intelligence may be classified into various systems, including artificial narrow intelligence and artificial general intelligence. Artificial narrow intelligence also called “weak” artificial intelligence, refers to systems that perform a single unique task with human-like proficiency, they have a limited range of capabilities” Harwood et al. (2019). “Artificial general intelligence systems have abilities to learn and understand, respond to human emotions, as well as perform multiple tasks like humans” Wahl et al. (2018).

“Machine learning is a subset of artificial intelligence which utilizes a set of algorithms and statistical models to enhance computers’

abilities to execute relevant tasks” Sanchez and Peters (2023). “The process by which computers are trained to identify patterns in datasets is known as the machine learning” Jovel and Greiner (2021). “Machine learning can be used clinically as an assessment tool in predicting the chances of developing specific solution or remedies to diseases according to the individual patient demographics, medical history, genetic information, and lifestyle factors. This will improve on the chances of early detection and early intervention to the medical issue. “AI-aided diagnostic methods can also facilitate the detection and diagnosis of non-communicable diseases, including those with significant public health implications like coronary artery disease” Garavand et al. (2023).

Other common artificial intelligence technologies in healthcare include natural language processing, image and signal processing, expert systems, and robotics. “Natural language processing aims to confer the ability to understand human language on computers so as to enable the extraction of information and patterns directly from patients’ verbal communication” Park et al. (2020). “Image and signal processing artificial intelligence collects and processes data to significantly improve accuracy in diagnoses” Rajeswari and Jagannath, (2017). “Some datasets where these have been successfully applied include audio recordings, micrographs, images from medical scans, cries of babies and breath sounds” Ting et al. (2017). “Expert systems utilize high-level proficiencies to give advice and proffer solutions regarding the diagnosis and prognosis of medical conditions, as well as educate healthcare professionals” Lee and Wang (2011). “The field of robotics started as an advancement in the field of mechanical and electronic engineering to perform repetitive tasks in industrial settings” Rajan and Saffiotti, (2017).

Efforts are also made to ensure that patients in developing countries have access to artificial intelligence in healthcare delivery. SpaceX for instance has ensured that third world countries have access to computers and the internet than ever before. With the increasing capabilities of AI over the internet, advanced machine learning algorithms can allow patients to get accurately diagnosed when they would previously have no way of knowing if they had a life-threatening disease or not.

There are diverse health applications of artificial intelligence for healthcare in third world countries. “Examples of these are the use of natural language processing models in epidemiological surveillance and disease prediction, as well as the combination of natural language processing models with expert systems to aid physicians in medical diagnosis” Wahl et al. (2018).

In a bid to strengthen this process, Oyewusi et al. (2021) examined the uses of natural language processing models to identify and extract cases of adverse drug reactions from open health discussions on social media and other online media conversations. Other findings have assessed the potential use of AI applications in Africa including its use in health insurance plans Owoyemi et al. (2023), diagnosis of colorectal cancer (Waljee et al. (2022), and the process of drug discovery and development Patel and Shah (2022).

Also, artificial intelligence-based chatbots and telehealth platforms have been proposed to address the shortage of health professionals in Africa Owoyemi et al., (2020). “Considering the high malaria burden in Africa and the associated high child mortality rate a new deep-learning model was recently studied to explore its utility in expediting malaria diagnosis and promoting measures to control the disease in Africa. The emergent results from the study indicate significant potential” (Oyewola et al., 2022).

In spite of international proof pointing out the prospects of artificial intelligence and machine learning in healthcare systems of developing countries’, there are however little information regarding the knowledge and perception of healthcare professionals regarding the usage of artificial intelligence and machine learning in Nigeria.

In the 1960s and 1970s the first problem-solving known as Dendral was invented. It was invented as a result of scientific research. After this breakthrough, a subsequent system known as MYCIN was created. It is considered one of the early uses of artificial intelligence in medicine. Alongside MYCIN, other systems such as INTERNIST-1 and CASNET did not achieve routine use by healthcare practitioners.

The 1980s and 1990s witnessed the proliferation of the microcomputers and higher

levels of network connectivity. During this time, a consensus was reached by researchers and developers that AI systems should be adopted in healthcare. Medical and technological advancements occurring over period that have enabled the growth of healthcare-related applications of AI to include:

- Faster data collection and data processing as a result of enhancement of computing processes.
- Growth of genomic sequencing of electronic databases.
- Increased implementation of health record systems.
- Improvements in natural language processing which enables machines replicate humans.
- Enhances robot-assisted surgery.

Telemedicine is an aspect of AI in healthcare that allows patients to be treated remotely. It also allows patients to be monitored remotely via sensors. Patients can be properly cared AI can assist in caring for by monitoring their information remotely. A wearable device allows patients to be monitored closely. It can detect changes that may not be easily noticed by humans. Pieces of information collected using artificial intelligence could be used to inform healthcare workers about any problems that may arise.

Chat bot therapy is another application of artificial intelligence in healthcare. Some researchers state that the use of chat-bots for mental healthcare cannot be compared to the care that would exist in the relationship between the patient suffering from mental healthcare issues and the healthcare personnel.

Objectives of the Study

The main objective of the study is to ascertain the awareness and utilization of artificial intelligence for health care practices among health care professionals in Enugu state, south east Nigeria. The specific objectives are to:

- I. ascertain the level of awareness of artificial intelligence for healthcare among Healthcare professionals in Enugu state, Southeast, Nigeria
- II. ascertain the extent artificial intelligence-based systems in medical

practice are being utilized amongst professionals in healthcare in Enugu State, Southeast, Nigeria.

- III. ascertain whether there are any factors inhibiting the knowledge and utilization of healthcare workers in Enugu state.

LITERATURE REVIEW

Conceptual Review

AI and the Nigerian Healthcare System

It has been predicted that AI in Nigeria's healthcare system is to grow significantly between 2022 and 2030. According to the Nigeria Health Facility Registry (NHFR), Nigeria has 39,914 operational hospitals and clinics with Benue, Lagos and Katsina being the top three states in the country with the most healthcare facilities. Nigeria has an average of 17 hospitals per 100,000 people, including private and public hospitals at the primary, secondary, and tertiary levels of health care. A lack of access to adequate healthcare facilities contributes immensely to Nigeria's high maternal and infant mortality rates. Nigeria has a high potential of adopting AI to its medical care because of its large population and high prevalence of disease. Some Nigerian healthcare institutions have started implementing AI systems to improve healthcare practices. For example, The Lagos University Teaching Hospital has introduced an AI-based system for diagnosing breast cancer. The system analyses mammograms through machine learning algorithms to detect early signs of breast cancer. An AI-powered telemedicine system was created by a Nigerian tech startup known as Wellvis to enable patients consult healthcare providers remotely so as to increase access to healthcare services, especially in rural areas where there are inadequate healthcare structures. With these little efforts made to infuse AI into healthcare delivery, intelligence in healthcare, it has been projected that AI will be further adopted in a few years. The Nigerian Communications Commission (NCC) launched a research grant programme to encourage the development AI in healthcare.

There are however some obstacles that will hinder the growth of AI in Nigerian healthcare system. First is a lack of adequate medical infrastructure, especially in rural areas. Second is that patients and healthcare workers have low digital literacy, which may limit the utilization of AI in medical practices. There is also the need for adequate regulatory frameworks for AI in healthcare to guarantee the safe and effective use of AI technologies in Nigeria.

Challenges of Artificial Intelligence in Nigerian Healthcare Practices

The following are a list of some of challenges that need to be addressed for the successful implementation of AI in healthcare: [report/nigeria-artificial-intelligence-ai-in-healthcare-market-analysis/#:~:text=Market Executive-,Nigeria's Artificial Intelligence\(AI\) in Healthcare Market is projected to,39%2C914 operational hospitals and clinics.](https://report/nigeria-artificial-intelligence-ai-in-healthcare-market-analysis/#:~:text=Market%20Executive-,Nigeria's%20Artificial%20Intelligence(AI)%20in%20Healthcare%20Market%20is%20projected%20to,39%2C914%20operational%20hospitals%20and%20clinics.)

- **Ethical and Legal Issues:** Ethical issues in areas such as patient consent, privacy, and reduced human interaction and empathy can arise in the use of AI technologies. Ensuring ethical guidelines and legal frameworks are critical to address these concerns and maintain patient trust. Medical regulatory bodies need to develop standards and guidelines for the use of AI in healthcare to ensure that it is used ethically and safely.
- **Resistance:** The acceptance and adoption of AI in healthcare may face resistance from healthcare professionals who may fear job displacement. Finding ways to overcome these concerns and is vital for successful implementation.
- **Safety and Reliability:** The safety and reliability of AI and robotic systems are important in healthcare practices. These systems must follow rigorous testing, validation, and regulatory measures to minimize the risk of errors, malfunctions, or adverse events.
- **Integration:** Integrating AI and robotics systems with existing healthcare infrastructure and information systems can be difficult. For instance, integrating AI with electronic health records (EHRs) and other healthcare technologies are essential for efficient workflow and data exchange. AI systems need

to be integrated into existing healthcare systems and workflows, which can be challenging.

- **Limited Clinical Evidence:** In spite of the prospect of AI in healthcare, there is still lack of sufficient clinical evidence support its efficacy. Therefore, more research is needed in this regard to develop enough evidence base in different healthcare applications and practices.
- **Data Quality:** AI depends on high quality data to generate accurate results, but healthcare data can be inconsistent and biased. There are concerns about the transparency of AI algorithms, as well as the potential for bias and discrimination. In addition, there are concerns about safeguarding patient privacy when sharing medical data for AI analysis.

Opportunities of AI in Nigerian Healthcare Delivery

Despite the above challenges, integrating AI in healthcare possesses numerous opportunities for advancements in patient care and healthcare operations.

Some of the main opportunities include:

- **Accuracy:** AI and robotic technologies can provide enhanced accuracy in surgical procedures, leading to better surgical outcomes and reduced risks. This can enable surgeons perform complicated tasks with improved accuracy, minimizing human errors.
- **Minimally Invasive Surgeries:** Robotic surgical systems enable minimally invasive procedures, resulting in smaller incisions, reduced scarring, and faster recovery times for patients. The use of AI can lead to shorter hospital stays, decreased post-operative pain, and a quicker return to daily activities.
- **Remote and Telemedicine Capabilities:** AI tools such as robots equipped with cameras, sensors and communication technology can facilitate remote monitoring and telemedicine. Healthcare professionals can remotely access patient information, provide consultations, and monitor vital signs in real-time, allowing for more efficient and accessible healthcare delivery.
- **Physically Demanding Tasks:** AI technologies like robots can help medical professionals in performing physically demanding tasks, reducing the strain on healthcare staff. This can free up healthcare

professionals' time to focus on more complex and critical aspects of patient care.

- **Optimized Healthcare Operations:** AI can optimize healthcare operations by automating tasks such as medication delivery, inventory management, and sterilization processes. This automation can improve efficiency, accuracy, and reduce the workload on healthcare staff, enabling them to focus on patient care and complex decision-making.
- **Training:** AI and robotic systems offer opportunities for training and simulation in healthcare. Surgeons and other healthcare professionals can refine their skills using virtual reality (VR) and augmented reality (AR) simulations.

• **Improved Diagnostics and Treatment:** AI have the potential to analyse large amounts of data and generate insights that can help healthcare providers make more accurate diagnoses and develop more effective treatments.

• **Personalized Medicine:** By analyzing patient data, AI can identify patterns and make predictions about individual patients' health risks and treatment needs. This can enable healthcare providers to deliver more personalized care.

• **Drug Discovery and Development:** AI can help identify new drug targets and accelerate the drug development process by simulating the effects of drugs on the body. Through capitalizing on these opportunities, AI is capable of significantly transforming healthcare, leading to improved patient outcomes, increased efficiency, and advancements in medical practice. Collaboration among healthcare professionals, technology developers, researchers, and policymakers are crucial to leverage these opportunities and ensure the successful integration of robotics into healthcare systems.

Empirical Review

There have been related works and research papers published on the use of AI in healthcare, addressing both the benefits and the potential challenges. Some of the related works in this area include:

“Awareness and utilization of artificial intelligence-based systems in biomedical translation in Nigeria” by Teibowei and Agbai (2023). The study investigated the extent of

awareness and utilization of artificial intelligence-based systems in biomedical translation amongst health professionals in medical tertiary institutions in Bayelsa State. These systems are designed to improve communication, knowledge sharing, and accessibility in the field of biomedicine, where accurate and efficient translation is crucial for effective healthcare delivery, research collaboration, and dissemination of medical information. The descriptive survey research method was used in the study. The population of the study comprised all three hundred and forty-three professionals in the three medical tertiary institutions in Bayelsa State formed the population of the study. A sample size of 299 respondents were drawn from the population. The instrument for data collection was “Awareness and Utilization of Translation APP Scale (AUTAS)” formulated by the researcher and validated by experts. The stratified random sampling technique was employed in the study. The findings revealed that the level of awareness and utilization of artificial intelligence-based systems in biomedical translation amongst health professionals in medical tertiary institutions in Bayelsa State was low. It was recommended that medical professionals should be effectively exposed to artificial intelligence-based systems in biomedical translation as this will enhance sustainability medical practice in Nigeria.

Amanawa and Amanawa (2024) “The Application of Artificial Intelligence (AI) in Medicine, with A Focus on Public Health Communication: Prospects for the Nigerian Health Sector” explored the main areas where AI contributes to public health communication as well as the limits and current state of AI in Nigeria. The study made use of secondary data to gather information concerning AI and public health communication. In medicine, artificial intelligence (AI) is evolving as a revolutionary force in various areas of health care, such as public health communication. The various roles AI play in health care include diagnostics and imaging, treatment personalization, public health surveillance and natural language processing. It also pointed out ethical considerations concerning AI in health care as follows: bias, issue of privacy, issue of consent among others. The researchers concluded their study by stating that an appropriate public health communication system will lead to a

successful implementation of AI in Nigeria's health care delivery system.

Adigwe et al (2023) “Exploring the matrix: knowledge, perceptions and prospects of artificial intelligence and machine learning in Nigerian healthcare.” The main objective of the study was to assess the knowledge and perception of healthcare professionals in Nigeria regarding the application of artificial intelligence and machine learning in the health sector. A cross-sectional study was undertaken among healthcare professionals across the six geopolitical zones in Nigeria with the use of a questionnaire. The population for the study was the total number of health professionals in Nigeria while the stratified multistage sampling method was used to draw out their sample size. A total of 500 copies of questionnaire were administered to participants and only 404 were returned. Findings from this study indicated that more than half of the respondents had a good knowledge of artificial intelligence and their applications in healthcare. Despite having a basic knowledge of artificial intelligence, the respondents lacked an understanding of its technical aspects. Based on the findings of this study, Nigerian healthcare professionals showed a high level willingness to adopt artificial intelligence innovations in their practices.

Robinson (2020) in his journal titled “Artificial Intelligence in Healthcare; its Knowledge, Practice and Perception among Medical Personnel in the Developing Economy” administered 510 copies of a questionnaire with the sole aim of evaluating the knowledge, practice and perception of AI in healthcare among healthcare providers. It was found that little was known about AI use in nursing, pathology and drug dispensing. Although the medical personnel under study were not using AI in the hospitals, they were willing to adopt it. The respondents expressed fear of job losses if AI will be utilized in healthcare delivery. The researcher finally recommended that training and regulation in the use of AI are necessary to improve the knowledge, practice and perception of AI in healthcare in the developing world.

Theoretical Framework

The most suited theory upon which to anchor the study is the diffusion of innovation theory.

The Diffusion of Innovation Theory will be used for this study. Diffusion of Innovation Theory developed by Everett Rogers in 1962. Everett Rogers, a Professor of rural sociology popularized the theory in his 1962 book: Diffusion of innovation.

It is one of the oldest social science theories. It emerged in communication to explain how a technological breakthrough becomes known and diffuses or spreads through the society because it is different from what the society had been used to. The key idea is that the media will first create awareness about the new technology. It is through this that diffusion is possible. "Diffusion is the process of spreading a given idea or practice over time, via specifiable channels, through a social structure such as neighborhoods" Katz (1963). According to Katz et al (1963), the diffusion of innovations process records that for a new idea or innovation to diffuse, there must be Awareness stage, Interest stage, Evaluation stage, and Trial and adoption stage. Bitter (1984) recognizes that the media can lead someone into getting aware of the existence of an item. From there he gets interested in, makes attempt to evaluate it, and gives it a trial touch before making up his mind to acquire it.

The diffusion of innovation theory explains how new ideas are spread among people through the media. Adoption of a new idea or technology does not happen immediately or overnight in a society rather it is a process whereby some people adopt the innovation before others.

RESEARCH METHODOLOGY

The Survey research design was adopted for this study because of the information required for the study. Survey design involves the collection of data from a relatively large number of people or items considered to be representative of the whole population or group.

The research employed a descriptive cross-sectional survey research design. The main objective of a descriptive survey research design is for accurate collection of data in order to properly describe the attributes of a given population. Furthermore, the descriptive survey is considered appropriate for this study, because of the large population. The research was performed at the Enugu State University

Teaching Hospital and University of Nigeria Teaching Hospital in South East Nigeria, because of the availability of a large population of healthcare professionals. The population for the study comprised 2,018 Healthcare Professionals (554 doctors, 1,134 nurses, 175 medical laboratory scientists, 33 physiotherapists, and 122 pharmacists). The sample size for the study is 323, using the Australian calculator. The researcher visited the two selected hospitals for two weeks in May 2024. The Likert questionnaire was used as the instrument of data collection. A research expert validated the questionnaire; to ensure reliability, the test retest method was used. This entails administering the same questionnaire to the same respondents after an interval of 5 days. The researcher administered 20 copies of questionnaire to respondents as a mode of pretest to answer the same questions in his research after 5 days of administering the first test, the researcher went for a retest and discovered 5 errors from the respondents. To calculate the reliability coefficient, the Guttman scale formula which was developed by Louis Guttman in 1944. The formula is:

$$1 - \text{total error/total Response}$$

$$1 - 5/20 = 1 - 0.25 = 0.75$$

Therefore, the reliability coefficient of questionnaire = 75% (very high).

Distribution of Returned and Unreturned Copies of the Questionnaire

Questionnaire	Frequency	Percentage
Returned Copies	310	96%
Unreturned Copies	13	4%
Total	323	100%

From the above, 323 copies of the questionnaire were distributed to the respondents. 96% were returned while 4% were unreturned.

Gender Distribution of the Respondents

Gender of Respondents	Frequency	Percentage
Male	105	33.9%
Female	205	66.1%

Total	310	100%
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From the above, majority of the respondents, 205 are females which represents 66.1% while the male respondents, 105, represent 33.9% of the population.

Occupation Distribution of the Respondents

Occupation	Frequency	Percentage
Doctors	52	17
Nurses	95	31
Medical lab scientists	43	14
Physiotherapists	20	6
Pharmacists	100	32
Total	310	100

From the above table, doctors are 52 in number, representing 17% of respondents, nurses are 95 in number representing 31% of respondents, medical laboratory scientists are 43 in number representing 14% of respondents, physiotherapists are 20 in number representing 6% of respondents and pharmacists are 100 in number representing 32% of respondents.

Age Distribution of the Respondents

Age Range of Respondents	Frequency	Percentage
21-30	148	48%
31-40	112	36%
41 and above	50	16%
Total	310	100

Research question one: What is the level of awareness of artificial intelligence for healthcare among healthcare professionals in Enugu State, Southeast Nigeria?

Response Category	Very High	Above Average	Average	Below Average	Very Low	Total
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	Above Average	Average	Below Average	Very Low	Total
Frequency	140	123	33	14	310
Percentage	45%	40%	11%	4%	100%

The above table sought the respondents' opinion on whether they are aware of the use of artificial intelligence for healthcare. 140 respondents which represents 45% of the population are above average aware of artificial intelligence for healthcare. 123 respondents which represents 40% of the population are on average aware of artificial intelligence. 33 respondents which represents 11% of the population are below average aware of artificial intelligence in healthcare while 14 respondents which represents 4% of the population have very low awareness about artificial intelligence in healthcare. The implication is that some healthcare workers in the selected hospitals in Enugu state are all aware of this new technical innovation called artificial intelligence in the area of healthcare practice.

Research question 2: What extent does artificial intelligence-based systems in medical practice are being utilized amongst professionals in healthcare in Enugu state, Southeast, Nigeria?

Response Category	Very High	Above Average	Average	Below Average	Very Low	Total
Frequency	0	0	0	33	277	310
Percentage	0	0	0	11%	89%	100%

The above table sought the respondents' opinion on whether artificial intelligence is being used or utilized among health workers. 33 respondents which represents 11% of the population are below average. 277 respondents representing 89% of the population are of the opinion that the use of AI in health is very low.

Research question 3: What are the factors inhibiting the utilization of AI in healthcare in Enugu state, Southeast, Nigeria?

Response	Frequency	Percentage
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Category		
Unemployment	45	15%
Bias	59	19%
Ethical issues	90	29%
Inadequate AI technologies in hospitals	116	37%
Total	310	100%

The implication of the above table showed that factors associated with utilization of AI in health were basically unemployment 45 (15%), bias 59 (19%), ethical issues 90 (29%) and inadequate AI technologies in hospitals 116 (37%).

Discussion of Findings

Discussions here are based on the research questions. The response gotten from the respondents indicated that some of the healthcare workers are aware of the use of artificial intelligence in healthcare practice. 140 respondents (45%) are above average, 123 respondents (40%) are average, 33 respondents (11%) are below average, and 14 respondents (4%) are very low. In order to know the opinions of the respondents on whether artificial intelligence is being used or utilized among health workers, 33 respondents which represents 11% of the respondents are below average. 277 respondents representing 89% of the respondents are of the opinion that the use of AI in health is very low. The factors that inhibited the utilization of AI in health were mainly unemployment 45 (15%), bias 59 (19%), ethical issues 90 (29%) and inadequate AI technologies in hospitals 116 (37%).

Summary and conclusion

The exclusive aim of the study was to determine the awareness and utilization of AI in healthcare practices among Healthcare Professionals in Enugu State, Southeast Nigeria. In achieving this the study assessed challenges and opportunities of AI in healthcare; as well discussed areas like chatbot therapy and telemedicine. In Enugu State, the awareness of AI is commendable but its utilization in healthcare is relatively poor because AI is a relatively new. The use of AI in healthcare has the potential to revolutionize patient care by improving outcomes, reducing

costs, and enhancing efficiency. However, ethical and regulatory concerns must be addressed to ensure the safe and effective use of AI in healthcare. By developing a robust regulatory framework and addressing ethical concerns, we can harness the power of AI to improve patient care and advance medical research while ensuring that the technology is used in a responsible and equitable manner.

Recommendations

- This research work would be incomplete if the researcher fails to include the recommendation that might be useful for the successful implementation of AI in healthcare:
- Healthcare professionals should be properly and continuously educated about artificial intelligence and its utilization. This can be done through seminars and the mass media. Hospitals should be encouraged to utilize AI related systems in healthcare practices. Utilizing or adopting AI in healthcare will make healthcare delivery easier, more efficient and more effective.
- In order to address the factors inhibiting the usage of AI in health, regulatory frameworks should be set in place to address issues regarding bias and ethics.
- Further research is also recommended in this area because of its novelty in Nigerian healthcare.

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