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KNOWLEDGE, ATTITUDE, AND PRACTICE OF MACHINE LEARNING FOR TREATMENTS PREDICTION AMONG HEALTHCARE WORKERS IN FEDERAL CAPITAL TERRITORY, NIGERIA

Augustine Ajogwu[1], Chineme Anowai[2], Chidumebi. F. Ajogwu[3]

[1,2]Department of Community Medicine, Nile University of Nigeria, Abuja.
[3]Department of Community Medicine, Godfrey Okoye University, Enugu

Email: austine.ajogwu2@gmail.com[1], anowaichineme@gmail.com[2]
ajogwudumebi@gmail.com[3]

[*]**Corresponding Author:** Dr. Augustine Ajogwu, MBBS, MBA, MPH, FMCPH/CM: Consultant Public Health Physician and Senior Lecturer, Department of Community Medicine and Public Health, Nile University of Nigeria, Abuja, Nigeria. Tel: 08035527638, 09033364436

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Abstract

This study explores the knowledge, attitudes, and practices of healthcare professionals regarding the use of Machine Learning (ML) algorithms for predicting treatment outcomes in the Federal Capital Territory (FCT), Nigeria. This cross-sectional study was conducted among doctors and nurses in the FCT. A structured questionnaire was designed to assess the participants' knowledge, attitudes, and practice concerning ML algorithms for predicting treatments. The survey covered socio-demographic characteristics, knowledge of ML applications in healthcare, attitudes towards incorporating ML into clinical decision-making and current practices regarding ML utilization. A total of 356 healthcare professionals participated in the study. The socio-demographic analyses showed that majority of participants were aged between 25-35 years, with a mean age of 33.97 years. Females comprised 86% of the respondents. The study revealed a significant knowledge gap, with 88.8% of participants having poor knowledge of ML applications in healthcare. Only 1.12% reported receiving formal training on ML, while 67.7% had heard of ML applications in healthcare. Attitudes towards ML were more positive, with 66.8% willing to incorporate ML recommendations into decision-making and 70.8% believe in the effectiveness of ML in predicting treatments. However, practical application was low, with none of the respondents using ML algorithms for treatment prediction. While attitudes towards ML are generally positive, poor knowledge and lack of practical application poses a major barrier to its adoption by health care

workers. There is need for targeted training programme to breach the gap, improved resource accessibility, institutional support and clear ethical frameworks for its adoption among health workers in the FCT.

Keyword: *Knowledge, Attitude, and Practice of Machine Learning Algorithms for Treatment Prediction Among healthcare workers in FCT, Nigeria*

AUTHORS BIOGRAPHIES

Augustine Ajogwu; Consultant Public Health Physician and Senior lecturer, Department of Community Medicine, Nile University of Nigeria, Abuja, Nigeria.

Augustine Ajogwu is specialist public health physician and health care manager, with graduate degrees and fellowship in public health and community medicine. He has worked in the field for some years now and has broad background and knowledge in public health and community medicine, Health Management and medical research. He had specialized training and expertise in public health and Epidemiology, health management/policy and data analysis.

He finished basic medical degree in 2002, Master of Business Management/Health Management degree in 2011 and Master of Public health degree in 2012, from Nigerian Universities. Subsequently, he joined medical specialty residency training in public health/community medicine and bagged membership of West African College of Physicians in 2016 and a Postgraduate Fellowship degree from the National Postgraduate Medical College of Nigeria in 2019. Since graduation, he has been working with faculty members of other Nigerian Universities in addition to his colleagues in the department of public health and students to conduct operational research in health management and policy, health systems, communicable/non-communicable diseases, social determinants of health, maternal and child health and infection prevention and control in health care settings. These research activities and experiences have enabled him to gain experiences in quantitative and qualitative research, epidemiology, manuscript writing, literature reviews and data analysis. It has provided him the opportunity to publish scientific articles in peer-review journals. Email:austine.ajogwu2@gmail.com ORCID: https//orcid.ord/0000-0001-7546-0835

Chineme Anowai; Nile University of Nigeria, Abuja

Chineme Anowai is a public Health Enthusiasts; He joined the Nile University of Nigeria and bagged Masters in Public health of the university and currently a public health professional in non-governmental organization in Abuja. Email: anowaichineme@gmail.com

Chidumebi.F. Ajogwu. Godfrey Okoye University. Chidumebi Ajogwu is a medical student with the Godfrey Okoye University and public health enthusiast and data analyst. Email.ajogwudumebi@gmail.com

Introduction

Machine learning (ML), a subset of Artificial Intelligence (AI), a groundbreaking field that brings remarkable possibilities for innovation. Essentially, it revolves around creating algorithms that empower computers to recognize patterns and make predictions or decisions without requiring explicit programming, offering unprecedented opportunities for innovation and advancement (Javaid et al, 2022). In healthcare, machine learning applications extend across various domains, leveraging vast datasets to uncover hidden patterns and relationships. One prominent application is in medical imaging, where machine learning algorithms excel in tasks like image recognition and segmentation. These algorithms can analyze complex medical images, such as MRIs or X-rays, aiding clinicians in the early detection of diseases like cancer (Habeh & Gohel, 2021). Additionally, machine learning plays a pivotal role in predictive analytics, utilizing patient data to forecast treatment, identify potential health risks, personalize treatment plans, enhance diagnostic accuracy, treatment planning, and overall patient care (Alowais et al, 2023).

The transformative impact of machine learning is not confined to diagnostics alone; it extends to diverse areas such as drug discovery, genomics, and patient management. Moreover, predictive models can assist healthcare providers in anticipating patient needs and intervening proactively, ultimately contributing to more effective and efficient healthcare delivery (Batko & Slezak, 2022). As machine learning continues to evolve, its applications in healthcare hold immense promise for advancing medical knowledge, improving patient outcomes, and revolutionizing the way healthcare professionals approach their practice (Muhammad et al, 2021). However, the effectiveness of this technological advancement is contingent upon the understanding, perceptions, and application by healthcare professionals.

Studies have shown that machine learning in healthcare enables early disease detection; personalized treatment plans, faster medical imaging interpretation, and improved patient care through predictive analytics, streamlined administrative processes, accelerated drug discovery, optimized resource allocation, and continuous learning (Olaoye & Egon Kaledio, 2023). Machine learning has emerged as a transformative force in global healthcare, playing a pivotal role in predicting treatments and enhancing patient care (Bajwa et al, 2021). Further studies have shown remarkable accuracy, such as the 96.5% prediction accuracy using FHS (Federal Health Service) dataset in the UK to create a risk prediction model for cardiovascular disease (CVD) due to type-2 diabetes (T2D) (Miao et al, 2020).

While the adoption of machine learning in healthcare has made significant strides globally, its implementation in Africa has been comparatively limited. According to a study published in Frontiers in Digital Health, the healthcare application of AI in Africa has only seen a few pilots and test cases (Owoyemi et al, 2020, Wu, 2023). Another study published in McKinsey & Company suggests that machine learning solutions can allow payers to evaluate value-based care and could capture efficiencies of up to 39 percent in South Africa, 15 percent in Kenya, and 4 to 10 percent in Nigeria by 2030 (Mckinsey, 2023). In Nigeria, for example, a Nigerian start-up is using a signal processing and machine learning-enabled system to improve the diagnosis of birth asphyxia in low-resource setting (African Healthcare Industry, 2023).

The research aims to access the knowledge, attitude, and practice of machine learning algorithms among health care workers in the Federal Capital Territory (FCT), with a focus on their use in predicting treatment. Understanding the current level of familiarity, attitudes, and implementation of machine learning in healthcare settings is crucial for optimizing the integration of advanced technologies into clinical practices.

METHODS

Study Design and Setting

The study was a cross-sectional study to determine the knowledge, attitude, and practice of machine learning algorithms for predicting treatments among healthcare workers in the Federal Capital Territory (FCT).

Study population

The study population included healthcare workers such as doctors, nurses, who were further categorized based on their job experience, active service and have been in the services for more than six months.

Sample Size Estimation

The sample size calculation formula for this study was be the Taro Yamani.

The sample size for the study was calculated using the formula below.

$n = z^2.p.q/d^2$ Where n = the desired sample size, Z = the standard deviation, usually set at 1.96 (which corresponds to 95% confidence interval) p = expected prevalence= 0.5(maximum variability assumed) q = 1.0 – pd (degree of accuracy) = 5%

$$n = \frac{1.96^2 * 0.5 * 0.5}{0.05^2} = 384.16$$

nf = n/1+(n)/(N)

N = 1956(total healthcare workers in FCT)-*FCT HHSS*

$$N = \frac{n}{1+\frac{n}{N}}$$ n_f= 384.16/1+384.16/1956

$n_f = \frac{384.16}{1+\frac{384.16}{1956}}$ nf= 321.09

Giving room for 10% (0.1) non-response, final Sample $= \frac{n}{1-NR}$

$= \frac{321}{1-0.1}$ = 356 health care workers

Health care workers were stratified into doctors and nurses for this study.

For doctors, the total population of doctors were 421.

Sample size for doctors $= \frac{421}{N} * 100 =$

Sample size for doctors $= \frac{421}{1956} * 100 = 21.5$ 21.5/100*356 = 77 Doctors

Sample size for Nurses = $\frac{1535}{1956} * 100 = 78.5$ 75.5/100*365 = 279 Nurses

Thus, the minimum sample size used for the study was be 356 (Doctors and Nurses). Multi-stage samling technique was use to select respondents, the study guaranteed a representative and unbiased sample of the healthcare workforce, capturing a broad spectrum of experiences and ensuring the robustness of the findings.

Study Instrument

The quantitative tool consisted of a structured questionnaire developed from the materials gotten from the previous studies. The questionnaire was used to elicit information on individual characteristics like age, sex, and religion; information on knowledge of machine learning including questions on application, attitude, practice and factors influencing knowledge, attitude and practice. The instrument entailed four sections: the socio-demographic, Knowledge of machine learning, Attitude to machine learning adoption, Practices of machine learning in healthcare and factors affecting the aforementioned.

Data Collection

This took place over a period of 2 months from April to June 2024. The quantitative tool was administered across the selected health care facilities in FCT.

Data Analysis

The quantitative data was entered into and analyzed using R Package for Social Science. Categorical data were summarized using proportion (percentage), while numerical data were summarized using mean, standard deviation and median. Results were presented in frequency tables and charts. Chi-square test was used to determine associations between socio-demographic variables, knowledge, attitude, and practice of machine learning algorithms to predict treatment with greater than 50% as good knowledge, attitude and practice among doctors and nurses in federal capital territory.

Ethical Consideration

An ethical approval was obtained from FCT Health Research Ethics Committee and Nile University Health Ethics Research Committee. A written informed consent to participate in the study was obtained from participants. The participants were provided with information about the objectives of the study, its methodology and potential risk and benefits in clear and concise language. Participants were also informed that the participation is voluntary and confidential, and that they could withdraw from the study at any point. Participants were informed that their data is confidential, will be anonymized and will not be shared with third party.

Results

Socio-demographic characteristics

A total of three hundred and fifty-six (356) healthcare professionals were involved in the survey with a 100% response rate. The Age ranges of respondents were between the ages of 25 and 50 years with the average age 34±8 years. Approximately, 46% are aged 25 to 35 years, 10.96% are under 22 years, 34% are between 35 to 50 and 8.7% are 50 years and above. Majority of the respondents have had experience between 5-10 years in the service. The respondents were distributed across various healthcare facilities in the Federal Capital Territory, with Federal Medical Centre, Jabi, had the highest respondents (27.81%), followed by Asokoro District Hospital (17.70%) and Maitama District Hospital (17.42%). Other facilities included Karshi General Hospital, National Hospital, Nyanya General Hospital, University of Abuja Teaching Hospital, and Wuse District Hospital, each with varying proportions of respondents. (Table 1)

Table 1: Socio-demographic Characteristics of Participants

Socio-demographic Variables	**Frequency (N= 356)**	**Proportion %**
Age		
Less than 25	39	10.96

25 – 35	164	46.07
35 – 50 years	122	34.27
50 years and above	31	8.71
Mean Age= 33.97 ±8.47		
Sex		
Male	50	14
Female	306	86
Level of experience		
Less than a year	26	7.30
1-5 years	139	39.04
6-10 years	98	27.53
10-15 years	55	15.45
16 years and above	38	10.67
Occupation		
Doctor	77	21.6
Health facility		
Asokoro District Hospital	63	17.70
Federal Medical Centre, Jabi	99	27.81
Karshi General Hospital	26	7.30
Maitama District Hospital	62	17.42
National Hospital	27	7.58
Nyanya General Hospital	30	8.43
University of Abuja Teaching Hospital	29	8.15
Wuse District Hospital	20	5.62

Knowledge of Machine Learning (ML) Algorithms to Predict Treatment

Approximately 98% of respondents reported that they have not received any form of training on machine learning, while 1.12% indicated that they received training. In contrast to trainings, 67.7% have heard of machine learning applications in healthcare and 32.30% have not. About 67.6% of respondents are not aware that machine learning applications can be used for predicting treatments in healthcare. However, more than 80% are aware of specific machine learning algorithms that have been successfully applied in predicting treatments in healthcare. There is

overall poor knowledge measured by 50% for good knowledge and <50% for poor knowledge, showed over 80% of doctors and nurses have little or no knowledge of machine learning and its use in predicting treatments. (Table 2)

Table 2: Knowledge of Machine learning algorithms to predict treatments

Variable	**Frequency N = 356**	**Proportion %**
Formal training or education on machine learning algorithms and their applications in healthcare?		
Yes	4	1.12
No	352	98.87
Machine learning algorithms and its applications		
Yes	115	32.30
No	241	67.70
Machine learning applications can be used for predicting treatments in healthcare.		
Yes	115	32.3
No	241	67.69
Sufficient level of training or familiarity with the concepts of machine learning algorithms for treatments?		
Yes	39	11.0
No	317	89.0
Machine learning algorithms commonly used for classification tasks in healthcare?		
Yes	42	11.8
No	314	88.2
Specific machine learning algorithms that have been successfully applied in predicting treatments in healthcare?		
Yes	67	18.8
Advancements and research on machine learning for healthcare		

Yes	90	25.3
Have doctors and nurses collaborated with data scientists or informaticians to develop and validate machine learning models for treatments in your facility or FCT?		
Yes	66	19.1
Knowledge score (%)		
>50% Good Knowledge	40	11.2
<50% Poor Knowledge	316	88.8

On the attitude of healthcare workers, findings show that the majority (66.8%) are willing to incorporate ML recommendations into their medical decision-making process, while a substantial portion (33.1%) are not. This indicates a strong openness to leveraging ML for clinical decisions.

More than half of the participants (55.6%) trust ML predictions for treatments over traditional methods, although a significant minority (44.38%) remains skeptical. This split suggests that while confidence in ML is growing, there is still some hesitation.

A notable 70.8% of respondents believe that ML will be effective in predicting treatments, showcasing optimism about its potential benefits. Additionally, an overwhelming 87.0% of respondents emphasize the importance of considering ethical aspects such as patient privacy and data security when implementing ML, highlighting a conscientious approach to its adoption. When it comes to improving patient outcomes, 61.23% of the participants believe ML has the potential to make a positive impact, reinforcing their positive outlook on ML's capabilities in enhancing healthcare quality.

However, there is a significant level of uncertainty regarding comfort with ML assisting in disease diagnosis. While 33.4% feel comfortable with the idea, a larger group (58.4%) is undecided, and a smaller portion of respondents (8.1%) feels uncomfortable. This indicates a need for more education and exposure to ML in clinical settings to alleviate concerns and build confidence.

Despite concerns about technological advancements, only 12.9% of participants worry that ML might replace doctors and nurses, whereas a vast majority (87.0%) do not share this concern. This suggests that healthcare professionals largely view ML as a tool to support rather than replace their roles.

Furthermore, 58.1% of participants are open to learning more about ML and using ML-based tools, indicating a strong interest in gaining further knowledge and skills in this area. There is also confidence that patients will be receptive to the use of ML in their care, with 75.5% of participants

believing in patient acceptance. This positive perception is crucial for the successful integration of ML in healthcare practices.

Lastly, most respondents (63.7%) view ML as an opportunity rather than a threat to healthcare in the Federal Capital Territory (FCT), underscoring an overall positive sentiment towards the future of ML in the medical field.

Analysis reveals a significant gap between the recognized potential of machine learning (ML) and artificial intelligence (AI) in healthcare and their actual use in practice. Despite acknowledging the benefits of these technologies in various applications, none of the respondents currently use ML algorithms for treatments. There is substantial support for integrating ML into medical education, with 50.84% favoring its use for training medical students. The diagnostic and prognostic capabilities of ML are highly valued, with 94.7% supporting its use for increasing diagnostic accuracy and 78.37% for assessing disease prognosis. Additionally, many see the utility of ML in predicting therapeutic intervention effects (78.0%) and evaluating treatment effectiveness (76.1%). However, there is considerable skepticism about using ML for making treatment decisions (only 28.4% support) and performing surgeries independently (40.1% support), highlighting a need for building trust through evidence-based practices. In summary, while healthcare professionals see the potential of ML and AI in enhancing patient care, actual adoption is hindered by several barriers. Focusing on education, targeted implementation, and addressing ethical concerns can pave the way for broader acceptance and integration of these technologies into everyday medical practice algorithms in health care practice in FCT.

Use of Machine Learning Algorithms to predict treatments

In consonance with poor knowledge of machine earning algorithms, result revealed a significant gap between the recognized potential of machine learning (ML) and artificial intelligence (AI) in healthcare and their actual use in practice. Despite acknowledging the benefits of these technologies in various applications, none of the participants currently use ML algorithms for treatments. Result showed significant gaps in the adoption of machine learning (ML) in healthcare due to a lack of training, resources, and institutional support, along with ethical concerns. None of the respondents have received training or access to resources for ML, and only 4.49% have received institutional support to enhance their ML knowledge. Additionally, just 1.12% reported having the necessary technological infrastructure for ML in their workplace. Ethical concerns are also prevalent, with the majority believing that issues such as patient privacy and data security could lead to resistance from healthcare professionals and patients. (Table 3)

Table 3: Practices of Machine learning by Health professionals.

Questions	**Frequency %** **N = 356**

Had any training with regards to machine learning in healthcare?		
Yes	0	0
No	356	100
Access to resources for machine learning in the context of healthcare?		
Yes	0	0
No	356	100
Institutional support shaping your knowledge of machine learning in healthcare?		
Yes	16	4.49
No	340	95.5
Technological infrastructure for machine learning in facility?		
Yes	4	1.12
No	352	98.8
Ethical concerns on use of sensitive health data by healthcare professionals.		
Yes	197	55.3
No	159	44.7
Concerns about the privacy and security of patient data in ML systems?		
Yes	218	61.2
No	138	38.8
Ethical Considerations associated with Machine learning		
Patients' privacy	29	8.14
Informed Consent	0	
Algorithmic transparency	0	

All of the above	327	91.8
Currently use Machine learning for treatment in the facility		
Yes	0	0
No	356	100

Discussion

Globally, the integration of Machine Learning in healthcare practice is still in its nascent stages, with significant variability in adoption rates. Machine learning has the potential to significantly improve healthcare delivery, access, equity, and efficiency in low-resource areas like sub-Saharan Africa. The findings mirror this global trend, emphasizing the need for targeted interventions to bridge the gap between knowledge, attitude, and practice.

Machine learning in healthcare offers vast and transformative opportunities. From improving the quality and efficiency of healthcare delivery to enhancing patient experience and driving innovation, it has the potential to revolutionize the healthcare sector. As healthcare continues to evolve, the integration of machine learning will play a crucial role in shaping the future of medicine, leading to better patient outcomes, reduced costs, and more efficient healthcare systems. The ongoing research and development in machine learning applications in healthcare will continue to uncover new opportunities and address existing challenges, ultimately benefiting patients, healthcare providers, and society.

The study found that 98.87% of doctors and nurses had no formal ML training, and 67.7% were unaware of ML applications in healthcare. The overall knowledge score revealed that 88.8% had poor ML knowledge, with social media being the primary source for those somewhat aware (94.9%). Similarly, a study at the Royal Free London NHS Foundation Trust showed that 63.64% of healthcare workers lacked experience with AI applications, and 87% could not distinguish between machine learning and deep learning, despite 50% being aware. Practical application is also limited, with only 5% using technologies like speech recognition daily, while 63% never use them, no educational resources to bridge the knowledge gap and improve ML application in healthcare (Wu, 2023). The study also showed that little or no practical implementation of machine learning in clinical settings among the surveyed healthcare professionals in the FCT. None of the participants reported using ML for treatments or any form in their current practice.

Several factors influence the knowledge, attitude, and practice of ML algorithms among healthcare professionals in FCT. Some socio-demographic characteristics such as age, occupation experience significantly affected the knowledge and attitude of the respondents, with the younger and less experienced healthcare professionals exhibiting poorer knowledge but with positive attitude to Machine learning. Most participants (66.8%) are willing to incorporate ML into their medical decision-making process, and a significant number (70.8%) believe that ML will be effective in predicting treatments. Ethical concerns, particularly regarding patient privacy and data security, are also prominent, with 87.0% acknowledging the importance of these issues. Establishing trust in ML technology necessitates addressing concerns related to reliability, accuracy, and ethical usage as foundational elements. This suggests that targeted training programs and awareness campaigns can effectively enhance the knowledge and practice of ML among the health care professionals in the FCT.

Collaboration in the development of ML systems and decision-making processes fosters positive attitudes, ensuring alignment with the specific needs and contexts of healthcare workers, as highlighted in Alowais *et al.'s* discussion on the role of artificial intelligence in clinical practice. This collaborative approach enhances the integration of ML into healthcare practices, promoting its effective utilization for improved patient outcomes (Alowais et al, 2023). However, there is substantial support for potential applications of ML, with 94.7% endorsing its use for increasing diagnostic accuracy and 78.37% for assessing disease prognosis. Younger healthcare professionals are more inclined to embrace machine learning technologies, potentially due to greater familiarity with digital tools and recent Information, Communication and Technology in-road in healthcare exposure (Jeyaraman et al, 2023 &Hamedani et al, 2023). Some barriers to the adoption of ML in healthcare were identified by the study. The lack of training and resources were primary obstacles, as shown, as all respondents (100%) indicated having not received any form training or access to ML resources. Institutional support is also minimal, with only 4.49% reporting any form of institutional encouragement for ML education.

Lack of technological infrastructure is another significant barrier, with only 1.12% of respondents indicating that their workplace does not have the necessary infrastructure to support ML applications. These barriers are exacerbated by ethical concerns, particularly around patient privacy and data security, which 55.3% of respondents believe could lead to resistance from both healthcare professionals and patients. By addressing these barriers, it is possible to leverage the potential of ML to improve diagnostic accuracy, predict treatments more effectively, and ultimately enhance patient care in the FCT.

Conclusion

The findings of this study highlight a significant gap between the recognized potential of ML in healthcare and its actual implementation in clinical practice within the FCT. Despite positive attitudes towards ML and its perceived benefits, substantial barriers hinder its adoption. Addressing these barriers is crucial for leveraging and adoption of ML technologies to enhance healthcare delivery and patient outcomes. There is an urgent need to develop and implement comprehensive capacity building programs focused on ML algorithms and their applications in healthcare. Studies have shown that the successful integration of ML in healthcare often requires

addressing educational gaps, enhancing infrastructure, and developing ethical frameworks to protect patient data (Hamedani et al, 2023). These programs should be integrated into both undergraduate and postgraduate medical education to ensure that healthcare professionals are equipped with the necessary knowledge and skills. Healthcare institutions must play a proactive role in facilitating the adoption of ML. This includes providing access to necessary resources such as software, datasets, and computational tools. Institutional support should also encompass financial investments in technological infrastructure and the creation of dedicated roles or teams focused on ML integration in clinical practice. Such measures will ensure that healthcare professionals have the tools and support needed to effectively utilize ML technologies.

Developing and enforcing robust ethical guidelines is essential to address concerns related to patient privacy, data security, and algorithmic transparency. These guidelines should be formulated through collaboration between healthcare professionals, data scientists, ethicists, and policymakers. Clear communication of these guidelines to both healthcare providers and patients is vital to build trust and acceptance. Encouraging collaboration between healthcare professionals and data scientists is critical for the successful integration of ML in healthcare. Interdisciplinary teams can work together to develop, validate, and refine ML models tailored to specific clinical needs. Such collaborations can also facilitate knowledge exchange and capacity building, fostering a culture of innovation and continuous improvement.

What is already known on this topic?

1). what is known on this topic has been the fact that machine learning algorithms are helping to revolutionize health care prediction of disease outcomes.

What this study adds:

1). what this study has added is that it has identified the level of knowledge, attitude and practice of machine learning algorithms use among health workers in the federal capital territory, Nigeria.

Competing interest

The author declares no competing interests.

Authors Contribution

Conceptualization: Augustine Ajogwu, Anowai Chineme, Chidumebi. F. Ajogwu,
Study design: Augustine Ajogwu, Anowai Chineme, Chidumebi. F. Ajogwu,

Data collection: Anowai Chineme,

Data analysis: Augustine Ajogwu, Anowai Chineme,

Interpretation of data: Augustine Ajogwu, Anowai Chineme,

Review of Literature: Augustine Ajogwu, Anowai Chineme

Writing and critical review of the manuscript: Augustine Ajogwu

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References

Javaid, M., Haleem, A., Singh, R. P., Suman, R., Rab, S. (2022). Significance of machine learning in healthcare: Features, pillars and applications. *International Journal of Intelligent Networks,* 3, 58-73. ISSN 2666-6030.

Habeh H., Gohel S. (2021). Machine Learning in Healthcare. *Curr Genomics*. 22(4):291–300. https://doi.org/10.2174/1389202922666210705124359

Alowais, S.A., Alghamdi, S.S., Alsuhebany, N., et al. (2023). Revolutionizing healthcare: the role of artificial intelligence in clinical practice. *BMC Med Education*. 23:689. https://doi.org/10.1186/s12909-023-04698-z

Batko, K., Ślęzak, A. (2022). The use of Big Data Analytics in healthcare. *J Big Data.* 9(1):3. https://doi.org/10.1186/s40537-021-00553-4

Muhammad, L.J., Al-Shourbaji, I., Haruna, A.A., Mohammed, I.A., Ahmad, A., Jibrin, M.B. (2021). Machine learning predictive models for coronary artery disease. *SN Computer Science.* 2(5):350.

Olaoye, G., Egon Kaledio. (2023). The influence of machine in deep healthcare. *J Machine Learning.*

Bajwa, J., Munir, U., Nori, A., Williams, B. (2021). Artificial intelligence in healthcare: transforming the practice of medicine. *Future healthcare journal.* 8(2):e188–e194. Available from: https://doi.org/10.7861/fhj.2021-0095

Miao, L., Guo, X., Abbas, H.T., Qaraqe, K.A., Abbasi, Q.H. (2020). Using machine learning to predict the future development of disease. *International Conference on UK-China Emerging Technologies (UCET). IEEE;* p. 1-4.

Owoyemi, A., Owoyemi, J., Osiyemi, A., Boyd, A. (2020). Artificial Intelligence for Healthcare in Africa. *Frontiers in Digital Health*.2:6. https://doi.org/10.3389/fdgth.2020.00006

Wu, F. (2023). Status and Prospects of Applying Machine Learning for Diagnosis and Treatment in African Healthcare Industry. *Highlights in Science, Engineering and Technology.* 45:25-30. https://doi.org/10.54097/hset.v45i.7297

Mckinsey & Company, (2023). How digital tools could boost efficiency in African health systems, https://www.mckinsey.com/industries/healthcare/our-insights/how-digitaltools-could-boost-efficiency-in-african-health-systems

African Healthcare Industry. (2023). *Highlights in Science, Engineering and Technology.* 45:2530. https://doi.org/10.54097/hset.v45i.7297

Alowais, S.A., Alghamdi, S.S., Alsuhebany, N., et al. (2023). Revolutionizing healthcare: the role of artificial intelligence in clinical practice. *BMC Med Educ.* 23:689. https://doi.org/10.1186/s12909-023-04698-z

Jeyaraman, M., Balaji, S., Jeyaraman, N., & Yadav, S. (2023). Unraveling the Ethical Enigma: Artificial Intelligence in Healthcare. *Cureus Journal*, 15(8), e43262.

Hamedani, Z., Moradi, M., Kalroozi, F., Manafi Anari, A., Jalalifar, E., Ansari, A., Aski, B.H., Nezamzadeh, M., Karim, B. (2023). Evaluation of acceptance, attitude, and knowledge towards artificial intelligence and its application from the point of view of physicians and nurses: A provincial survey study in Iran: A cross-sectional descriptive-analytical study. *Health Sci Rep*.6(9):e1543. https://doi.org/10.1002/hsr2.1543