IJIMM, Volume 2, Issue 6, 2024 ISSN: 2995-5319
http://medicaljournals.eu/index.php/IJIMM

INTERNATIONAL JOURNAL OF INTEGRATIVE AND MODERN MEDICINE

Utilizing Data Analytics and Health Information to Drive Insights and Innovation in Healthcare: A Case Study of University College Hospital, Ibadan, Oyo State

Layemo Princewill Adeoye
Lead City University, Ibadan, Oyo State, Nigeria

Adeoye Buzrat Adetoro
Ladoke Akintola University of Technology

Adenike O Fagbamigbe
Community Health Officers Training Programme UCH Ibadan.

Samuel Omowale Okijiola
Department of Human Nutrition and Dietetics,
Faculty of Public Health, University of Ibadan

Jayeoba Olufunke Felicia
University of Adeleke (Health Information Department)

Ogundare Atinuke Adijat
Kaduna Polytechnic PHC Tutor Institute

Abstract

Introduction: The integration of data analytics and health information systems is revolutionizing healthcare by enabling more informed decision-making and fostering innovation. At the University College Hospital (UCH) in Ibadan, these technologies are being increasingly adopted to improve patient care, optimize operations, and enhance overall healthcare outcomes. This study aims to explore the extent to which data analytics and health information systems are being utilized at UCH, assess the awareness and perception of their effectiveness among healthcare professionals, and identify the key challenges and future prospects associated with their use.

Objectives: The primary objectives of this study are to assess the awareness and effectiveness of data analytics in decision-making processes, identify the challenges faced in its implementation, and explore the potential future benefits and applications of data analytics at UCH.

Method of Analysis: The study employed Stratified Random Sampling to select a sample size of 300 respondents from various strata within UCH, including healthcare professionals, hospital

administrators, and patients. Data analysis involved basic descriptive statistics, such as mean, mode, median, and percentages, along with qualitative data analysis to interpret and categorize responses.

Results: The findings revealed a high level of awareness (80.0%) among respondents regarding the use of data analytics and health information systems at UCH. The effectiveness of data analytics in decision-making was rated positively by 46.7% of respondents, while 20.0% remained neutral, and 13.3% found it ineffective. Significant contributions to healthcare outcomes were noted by 80.0% of respondents. However, challenges such as data privacy concerns (20.0%) and budget constraints (20.0%) were highlighted. Future advancements in personalized medicine and artificial intelligence integration were anticipated by 66.7% and 33.3% of respondents, respectively.

Conclusion: The study underscores the significant impact of data analytics and health information systems at UCH. Continued investment in training, infrastructure, and strategic collaborations is recommended to enhance healthcare delivery and innovation. Addressing existing challenges and leveraging advanced technologies will ensure UCH remains a leader in utilizing data analytics for improved patient outcomes.

Keywords: Data analytics, health information systems, healthcare innovation, University College Hospital, patient outcomes, personalized medicine, artificial intelligence.

Introduction:

Insight and innovation in healthcare involve the capacity to gain an accurate and deep understanding of healthcare practices through the collection and use of information. This understanding is crucial for developing new ideas, methods, products, services, or solutions that significantly impact patients and the entire healthcare organization positively (Wang, Kung, & Byrd, 2018). By transforming creative concepts into tangible outcomes, healthcare providers can improve efficiency and effectiveness and address unmet needs (Sun & Reddy, 2013). This process relies on the accurate understanding and systematic application of knowledge gained from well-analyzed health information, thereby creating new and improved ways of delivering healthcare services (Groves et al., 2013).

Data analytics is the collection, transformation, and organization of data to draw conclusions, make predictions, and drive informed decision-making. This process, which includes inspecting, cleansing, transforming, and modeling data, aims to discover useful information, draw informed conclusions, and support decision-making. Depending on the information extracted and the decisions to be made, five main types of data analytics can be invested in: descriptive analytics, diagnostic analytics, predictive analytics, prescriptive analytics, and cognitive analytics. The five-step framework for analyzing data includes identifying business questions, collecting and storing data, cleaning and preparing data, analyzing data, and visualizing and communicating data.

Health information consists of recorded facts concerning a patient, their illness, and the events occurring during professional care. This information is crucial for providing the best medical care, teaching, research, studying medical practices, and meeting legal requirements (Benjamin, 2001). According to Osundina (2014), health records contain the history of illness, medical investigations, test results, examinations, diagnoses, and treatments. Accurate and timely records are critical for driving insights and innovation in healthcare.

The healthcare sector generates an unprecedented amount of data daily, including electronic health records (EHRs), patient histories, diagnostic images, clinical trial data, and administrative information. This data explosion, driven by the digitization of healthcare systems and the proliferation of health monitoring devices, presents both significant opportunities and challenges (Raghupathi & Raghupathi,

2014). Data analytics involves examining large and varied data sets—big data—to uncover hidden patterns, unknown correlations, market trends, customer preferences, and other useful business information. In healthcare, data analytics can transform raw health data into actionable insights that enhance decision-making, improve patient outcomes, and streamline operations (Groves et al., 2013).

Advanced data analytics tools help clinicians make informed decisions by providing insights into patient conditions, predicting disease outbreaks, and suggesting personalized treatment plans based on historical data and current trends (Sun & Reddy, 2013). Analyzing historical data enables predictive models to forecast future health events, such as identifying patients at high risk of developing chronic conditions, facilitating early intervention and prevention strategies (Obermeyer & Emanuel, 2016). Healthcare organizations use data analytics to optimize resource allocation, manage supply chains, improve patient flow, and reduce waiting times, resulting in cost savings and improved service delivery (Wang, Kung, & Byrd, 2018). Data analytics supports the creation of personalized health plans tailored to individual patient needs and preferences, enhancing patient engagement and adherence to treatment protocols (Bates et al., 2014). In pharmaceutical and medical research, data analytics accelerates the discovery of new drugs and therapies by identifying potential candidates and predicting their success rates (Murdoch & Detsky, 2013).

Health information systems (HIS) are crucial for the effective collection, storage, and management of healthcare data. These systems ensure that data is accurately captured, securely stored, and easily accessible for analysis. Interoperability among different HIS is essential for creating a comprehensive view of patient health and enabling seamless data exchange across various healthcare providers and systems (Haux, 2006).

While the potential benefits are substantial, several challenges must be addressed to fully harness the power of data analytics in healthcare. Ensuring the confidentiality and security of patient data is paramount. Healthcare organizations must comply with regulations such as HIPAA in the United States and GDPR in Europe (Kshetri, 2014; Fernandez-Aleman et al., 2013). Inconsistent data formats and poor data quality can hinder effective analysis. Standardizing data collection and ensuring high-quality data inputs are critical (Weiskopf & Weng, 2013). Integrating data from disparate sources and ensuring interoperability between different health information systems remain significant challenges (Vest & Gamm, 2010). There is a need for healthcare professionals trained in data analytics and health informatics to interpret data effectively and implement insights (Hersh, 2012).

Driving insights and innovation in healthcare is critical for the development of the healthcare delivery system. Observations indicate that the partial use of data analytics models and health information for informed conclusions and decision-making in many Nigerian healthcare facilities has adverse consequences on driving insights and innovation in healthcare. This study examines the influence of data analytics and health information on driving insights and innovation in healthcare at the University College Hospital, Ibadan. It aims to contribute to solving problems associated with data analytics and health information in relation to driving insights and innovation in healthcare.

Methods

Study Area

The University College Hospital (UCH) in Ibadan, Nigeria, established in 1957, is a prominent healthcare institution. It serves as a central hub for healthcare delivery in the region, renowned for its modern facilities, including advanced medical equipment and digital health records systems. UCH offers a wide range of medical services and exemplifies the integration of modern technology and medical practice. Affiliated with the University of Ibadan, UCH fosters interdisciplinary collaboration, providing

ample opportunities for leveraging data analytics in healthcare delivery. By analyzing large datasets from electronic health records, diagnostic imaging, and clinical trials, UCH enhances clinical decision-making, enables personalized care approaches, and optimizes healthcare delivery processes. Additionally, UCH engages in community health initiatives, harnessing health information to improve population health outcomes and reduce healthcare disparities.

Study population

The study population for researching the utilization of data analytics and health information to drive insights and innovation in healthcare at the University College Hospital (UCH) in Ibadan, Oyo State, Nigeria, encompass healthcare professionals, hospital administrators, and patients. Healthcare professionals such as doctors, nurses, pharmacists, laboratory technicians, and other allied healthcare professionals directly involved in patient care and decision-making processes are vital stakeholders. Hospital administrators, including hospital managers, department heads, and administrative staff responsible for overseeing the implementation and management of data analytics tools and health information systems, also constitute an essential part of the study population. Additionally, patients who have received healthcare services at UCH are included in the study population as they can provide valuable insights into their experiences with data-driven healthcare practices and innovations.

Sampling Technique

The study employed Stratified Random Sampling, dividing the study population at the University College Hospital (UCH) in Ibadan into categories or strata, including healthcare professionals, hospital administrators, and patients. This approach aimed to ensure representation from each group, facilitating a comprehensive understanding of data analytics and health information utilization across various stakeholders. Additionally, randomly selecting a proportional number of respondents from each stratum helped mitigate bias and increase the generalizability of the findings. A total of 300 respondents were selected from each stratum as the sample size.

Data analysis

Data analysis involved the application of basic descriptive statistics, including measures such as mean, mode, median, and percentages. Qualitative data analysis focused on interpreting, describing, and documenting the content of the information provided. Themes relevant to the data were identified and used for organizing and categorizing qualitative data through coding and sorting processes.

Ethical consideration

Prior to commencing the study, ethical approvals were obtained from the ethical review committees of the University College Hospital (UCH) to ensure compliance. Informed written consent and permission were secured from all respondents, guaranteeing their voluntary participation. All data collected from participants will be used solely for research purposes and stored securely with each questionnaire identified by a unique number to safeguard confidentiality and prevent access by third parties.

Results

Table 1: Sociodemographic Characteristics of the respondents

Variable	Frequency(n=300)	Percentages
Gender		
Female	160	53.3
Male	140	46.7
Age		
20-30	80	26.7
31-40	80	26.7

41-50	70	23.3
51-60	50	16.7
Over 60	20	6.7
Mean±S.D	*39.3±13.34*	
Job Position		
Doctor	100	33.3
Nurse	60	20.0
Information manager	50	16.7
Laboratory attendant	40	13.3
Admin officer	50	16.7
Years of experience in healthcare		
< 5 years	60	20.0
5-10	80	26.7
11-15years	50	16.7
16-20 years	40	13.3
>20years	70	23.3
Mean±S.D	*12.2±7.29*	
What department are you currently working in?		
General Medicine	100	33.3
Surgery	*60*	20.0
Pediatrics	*50*	16.7
Radiology	*30*	10.0
Administration	*40*	13.3
Laboratory	*10*	3.3
IT	*10*	3.3

Table 1 shows the socio demographic characteristics of the respondents, Among the 300 respondents, the gender distribution was relatively balanced, with a slightly higher representation of females. Specifically, 160 respondents (53.3%) were female, while 140 respondents (46.7%) were male. The age of the respondents varied across several age groups, with the largest groups being those aged 20-30 years and 31-40 years, each comprising 80 respondents (26.7%). The next largest age group was 41-50 years, with 70 respondents (23.3%). Those aged 51-60 years accounted for 50 respondents (16.7%), and the smallest group was respondents over 60 years, totaling 20 respondents (6.7%). The mean age of the respondents was approximately 39.3 years, with a standard deviation of 13.34 years, indicating a moderate spread around the mean age.

The distribution of job positions among the respondents indicated a diverse representation of roles within the healthcare setting. The largest group consisted of doctors, with 100 respondents (33.3%). Nurses comprised the next largest group with 60 respondents (20.0%). Information managers and administrative officers each represented 50 respondents (16.7%). Laboratory attendants accounted for 40 respondents (13.3%). Regarding years of experience in healthcare, the respondents showed a range of experience levels. Those with less than 5 years of experience numbered 60 (20.0%), while those with 5-10 years of experience made up 80 respondents (26.7%). There were 50 respondents (16.7%) with 11-15 years of experience, 40 respondents (13.3%) with 16-20 years of experience, and 70 respondents (23.3%) with more than 20 years of experience. The mean years of experience was approximately 12.2 years, with a

standard deviation of 7.29 years, suggesting a considerable range of experience among the respondents. In terms of departmental distribution, respondents were affiliated with various departments within the healthcare setting. The most represented departments included General Medicine (33.3%), Surgery (20.0%), Pediatrics (16.7%), Radiology (10.0%), Administration (13.3%), Laboratory (3.3%), and IT (3.3%). This diversity underscores the multidisciplinary nature of the healthcare workforce and the breadth of expertise encompassed within the study sample.

Table 2: Utilization of Data Analytics and Health Information among the respondents

Variables	Frequency	Percentage
Are you aware of the use of data analytics and health information systems at UCH for driving insights and innovation in healthcare?		
Yes	240	80.0
No	60	20.0
How would you rate the effectiveness of data analytics in improving decision-making?		
Effective	140	46.7
Neutral	60	20.0
Ineffective	30	10.0
Very ineffective	10	3.3
To what extent do you believe that data analytics have contributed to improving outcomes?		
Significantly contributed	105	35.0
Moderately contributed	135	45.0
Slightly contributed	60	20.0
Have you received training on utilizing data analytics and health information systems?		
Yes	180	60.0
No	120	40.0
Which of the following data sources does your department primarily use for analytics?		
Electronic Health Records(EHR)	150	50.0
Diagnostic Imaging	120	40.0
Clinical trials Data	90	30.0
Administrative data	100	33.3
Wearable devices data	80	26.7

Table 2 shows the utilization of data analytics and health information among the respondents. Out of the 300 respondents, a significant majority of 240 respondents (80.0%) reported being aware of the use of data analytics and health information systems at the University College Hospital (UCH) for driving insights and innovation in healthcare. In contrast, 60 respondents (20.0%) indicated they were not aware of such utilization.

Regarding the effectiveness of data analytics in improving decision-making processes at UCH, 140 respondents (46.7%) rated it as effective. A smaller portion of 60 respondents (20.0%) remained neutral on its effectiveness. Some respondents, 30 (10.0%), rated it as ineffective, while a very small number, 10 respondents (3.3%), considered it very ineffective.

When asked about the extent to which data analytics has contributed to improving healthcare outcomes, 105 respondents (35.0%) believed it has significantly contributed, and 135 respondents (45.0%) felt it has moderately contributed. Sixty respondents (20.0%) stated it has only slightly contributed to improvements in healthcare outcomes. In terms of training, 180 respondents (60.0%) reported having received training on utilizing data analytics and health information systems, while 120 respondents (40.0%) had not received such training.

The primary data sources used for analytics in respondents' departments were also identified. Electronic Health Records (EHR) were the most commonly used, with 150 respondents (50.0%) indicating their use. Diagnostic imaging was used by 120 respondents (40.0%), clinical trials data by 90 respondents (30.0%), administrative data by 100 respondents (33.3%), and wearable devices data by 80 respondents (26.7%).

Overall, these results suggest a strong awareness and moderate to high perceived effectiveness of data analytics and health information systems at UCH, coupled with a significant level of training among respondents. However, there is room for increased awareness and training, particularly in advanced analytics techniques like machine learning.

Table 3: Challenges and barriers

Main challenges	Frequency	Percentage
Data privacy and security concerns	60	20.0
Lack of standardized data formats	40	13.3
Integration with existing systems	50	16.7
Insufficient data quality	30	10.0
Lack of skilled personnel	40	13.3
Budget constraints	60	20.0
Resistance to change	20	6.7

Table 3 provides insight into the main challenges and barriers encountered in the utilization of data analytics and health information at UCH. Notably, data privacy and security concerns are identified as the most prevalent challenge, with 20% of respondents citing it as a significant barrier. Other notable challenges include budget constraints, lack of standardized data formats, and integration issues with existing systems, each reported by varying percentages of respondents ranging from 10% to 20%. Additionally, 13.3% of respondents highlighted the lack of skilled personnel as a hindrance, while resistance to change was mentioned by 6.7% of respondents

Table 4: Addressing Data Privacy and Security Issues

Methods used to Address Data Privacy and Security	Frequency	Percentage
Compliance with HIPAA/GDPR	80	26.7
Regular security audit	60	20.0
Data encryption	60	20.0
Access control measures	50	16.7
Staff training programs	50	16.7

Table 4 outlines the methods employed to address data privacy and security issues at UCH. The most commonly utilized method is compliance with HIPAA/GDPR, with 26.7% of respondents indicating its use. Regular security audits and data encryption are also prevalent strategies, each reported by 20% of

respondents. Access control measures and staff training programs are implemented by 16.7% of respondents each, highlighting the multifaceted approach adopted by UCH to safeguard data privacy and security.

Table 5: Future directions and Innovations

Variable	Frequency	Percentage
What potential innovations do you foresee as a result of utilizing data analytics in healthcare? (Select all that apply)		
Development of new diagnostic tools	150	50.0
Advances in personalized medicine	200	66.7
Predictive analytics for preventive care	120	40.0
Real-time health monitoring	100	33.3
Integration with artificial intelligence	180	60.0
What additional resources or support would help your department better utilize data analytics? (Select all that apply)		
Advanced training programs	180	60.0
Improved data infrastructure	200	66.7
Collaboration with tech companies	100	33.3
Government support and policies	80	26.7
How likely is your organization to increase its investment in data analytics in the next 3-5 years?		
Very unlikely	20	6.7
Unlikely	30	10.0
Neutral	50	16.7
Likely	150	50.0
Very likely	100	33.3

Table 5 presents the future directions and innovations anticipated as a result of utilizing data analytics in healthcare, as well as the additional resources or support needed to enhance the utilization of data analytics within departments. Notably, 50% of respondents foresee the development of new diagnostic tools, while 66.7% anticipate advances in personalized medicine. Moreover, 60% of respondents believe that advanced training programs and improved data infrastructure would be beneficial, while 50% express a likelihood of increasing investment in data analytics within the next 3-5 years. Additionally, 33.3% of respondents perceive a high likelihood of integration with artificial intelligence and very likely investment in data analytics.

Discussion of Findings

The job positions among the respondents showed a broad range of roles within the healthcare environment, which is vital for effective data analytics utilization. The majority were doctors, with 100 respondents (33.3%), followed by nurses at 60 respondents (20.0%). Information managers and administrative officers each constituted 50 respondents (16.7%), while laboratory attendants made up 40 respondents (13.3%). This diverse range of roles supports Benjamin's (2001) assertion on the importance of various roles in implementing effective health information management strategies.

Regarding years of experience in healthcare, the respondents had varied experience levels. Those with less than 5 years of experience numbered 60 (20.0%), while those with 5-10 years of experience comprised 80 respondents (26.7%). There were 50 respondents (16.7%) with 11-15 years of experience,

40 respondents (13.3%) with 16-20 years of experience, and 70 respondents (23.3%) with more than 20 years of experience. The average years of experience was around 12.2 years, with a standard deviation of 7.29 years, indicating a significant range of experience among the respondents. This diversity in experience levels is crucial for understanding different perspectives on data analytics and its impact on healthcare practices, as noted by Haux (2006) in his study on the evolution of health information systems.
In terms of departmental distribution, respondents were from various departments within the healthcare setting. The most represented departments were General Medicine (33.3%), Surgery (20.0%), Pediatrics (16.7%), Radiology (10.0%), Administration (13.3%), Laboratory (3.3%), and IT (3.3%). This diversity underscores the multidisciplinary nature of the healthcare workforce and the broad range of expertise encompassed within the study sample, consistent with Hersh's (2012) emphasis on interdisciplinary collaboration in health informatics.
Among the 300 respondents, a significant majority of 240 respondents (80.0%) reported awareness of the use of data analytics and health information systems at the University College Hospital (UCH) for driving insights and innovation in healthcare. In contrast, 60 respondents (20.0%) were not aware of such utilization. This high level of awareness indicates the growing integration of data analytics in healthcare settings, as highlighted by Bates et al. (2014) and Groves et al. (2013).
Regarding the effectiveness of data analytics in improving decision-making processes at UCH, 140 respondents (46.7%) rated it as effective, while 60 respondents (20.0%) were neutral. Some respondents, 30 (10.0%), rated it as ineffective, and a small number, 10 respondents (3.3%), considered it very ineffective. These findings suggest a general consensus on the positive impact of data analytics, while also highlighting areas needing improvement. This aligns with Raghupathi and Raghupathi's (2014) discussions on the potential and challenges of big data analytics in healthcare.
As regards the extent to which data analytics has contributed to improving healthcare outcomes, 105 respondents (35.0%) believed it has significantly contributed, while 135 respondents (45.0%) felt it has moderately contributed. Sixty respondents (20.0%) stated it has only slightly contributed to improvements in healthcare outcomes. These insights reflect the multifaceted benefits of data analytics in enhancing patient care, as discussed by Wang et al. (2018) and Obermeyer and Emanuel (2016). 180 respondents (60.0%) reported having received training on utilizing data analytics and health information systems, while 120 respondents (40.0%) had not received such training. This indicates that a significant portion of the workforce is equipped with the necessary skills, though broader training initiatives are still needed. Kshetri (2014) and Murdoch and Detsky (2013) have both noted the critical role of training in the effective implementation of data analytics in healthcare. The primary data sources used for analytics in respondents' departments were identified. Electronic Health Records (EHR) were the most commonly used, with 150 respondents (50.0%) indicating their use. Diagnostic imaging was used by 120 respondents (40.0%), clinical trials data by 90 respondents (30.0%), administrative data by 100 respondents (33.3%), and wearable devices data by 80 respondents (26.7%). These findings highlight the diverse data sources utilized for analytics, supporting Weiskopf and Weng's (2013) assertion on the importance of varied data sources for comprehensive analytics.
Data privacy and security concerns were identified as the most prevalent challenge, with 20% of respondents citing it as a significant barrier. Other notable challenges included budget constraints, lack of standardized data formats, and integration issues with existing systems, each reported by varying percentages of respondents ranging from 10% to 20%. Additionally, 13.3% of respondents highlighted the lack of skilled personnel as a hindrance, while resistance to change was mentioned by 6.7% of respondents. These challenges resonate with the findings of Fernandez-Aleman et al. (2013) and Vest and Gamm (2010), who documented similar barriers in the literature.

To address data privacy and security issues, UCH has implemented several methods. The most commonly utilized method is compliance with HIPAA/GDPR, with 26.7% of respondents indicating its use. Regular security audits and data encryption are also prevalent strategies, each reported by 20% of respondents. Access control measures and staff training programs are implemented by 16.7% of respondents each. This multifaceted approach reflects Sun and Reddy's (2013) and Groves et al.'s (2013) recommendations for ensuring robust data security and privacy in healthcare settings. Looking towards the future, 50% of respondents foresee the development of new diagnostic tools, while 66.7% anticipate advances in personalized medicine. Moreover, 60% of respondents believe that advanced training programs and improved data infrastructure would be beneficial, while 50% express a likelihood of increasing investment in data analytics within the next 3-5 years. Additionally, 33.3% of respondents see a high likelihood of integration with artificial intelligence and increased investment in data analytics. These optimistic projections align with the transformative potential of big data and analytics in healthcare as envisioned by Groves et al. (2013) and Murdoch and Detsky (2013).

Conclusion

The findings from this study underscore the significant impact and potential of data analytics and health information systems at the University College Hospital (UCH), Ibadan. With a high level of awareness among healthcare professionals and a positive perception of the effectiveness of data analytics in improving decision-making and healthcare outcomes, there is a clear pathway for further integration and enhancement of these systems.

To fully realize the benefits of data analytics, it is recommended that UCH continue to invest in comprehensive training programs. Given that 40% of respondents have not received training, expanding educational initiatives will equip more staff with the necessary skills to utilize data analytics effectively. Addressing the identified challenges, such as data privacy and security concerns, budget constraints, and the lack of standardized data formats, is essential. The hospital should enhance its data governance policies, ensuring compliance with relevant regulations, and regularly conduct security audits and staff training programs to protect patient data. Additionally, improving data integration with existing systems and increasing the budget allocation for data analytics infrastructure will mitigate these barriers and foster a more cohesive and efficient data environment.

Future investments should focus on developing advanced data infrastructure and fostering collaborations with technology companies to enhance data analytics capabilities. Such collaborations can lead to the development of innovative diagnostic tools and personalized medicine solutions, significantly advancing patient care.

Furthermore, it is advisable for UCH to explore the integration of artificial intelligence with data analytics, as 60% of respondents foresee this as a future direction. This integration can provide predictive analytics for preventive care and real-time health monitoring, thereby improving patient outcomes and operational efficiency.

In conclusion, by addressing the existing challenges and leveraging the potential of data analytics, UCH can enhance its healthcare delivery and foster innovation. Continued investment in training, infrastructure, and strategic collaborations will ensure that UCH remains at the forefront of utilizing data analytics to drive insights and innovations in healthcare, as evidenced by the promising responses from the study participants.

Reference

1. Amber, K., & Krosel, C. (2023). Indeed career guide. Indeed. https://www.indeed.com/careerguide
2. Angrell, W. (1998). Computers, health records and citizen rights. Washington D.C: U.S. Government Printing Office.
3. Bates, D. W., Saria, S., Ohno-Machado, L., Shah, A., & Escobar, G. (2014). Big data in health care: Using analytics to identify and manage high-risk and high-cost patients. *Health Affairs, 33*(7), 1123-1131.
4. Benjamin, B. (2001). Medical records. London: Willian Heinemann Medical Book Limited.
5. Benjamin, J. A. (2001). Health information management: What strategies? *Health Information Management Journal, 30*(1), 13-17.
6. Coursera. (2024). Data analytics for effective management. Cloudian Publisher. https://www.deliotte.com/insight
7. Deliotte Insights. (2023). Data management made simple, scalable and cost effective. Cloudian Publisher. https://www.deliotte.com/insight
8. Fernandez-Aleman, J. L., Senor, I. C., Lozoya, P. A. O., & Toval, A. (2013). Security and privacy in electronic health records: A systematic literature review. *Journal of Biomedical Informatics, 46*(3), 541-562.
9. Groves, P., Kayyali, B., Knott, D., & Kuiken, S. V. (2013). The 'big data' revolution in healthcare: Accelerating value and innovation. McKinsey & Company.
10. Haux, R. (2006). Health information systems–past, present, future. *International Journal of Medical Informatics, 75*(3-4), 268-281.
11. Hersh, W. (2012). Health informatics: Practical guide for healthcare and information technology professionals (5th ed.). Informatics Education.
12. Kshetri, N. (2014). The emerging role of big data in key development issues: Opportunities, challenges, and concerns. *Big Data & Society, 1*(2), 1-20.
13. Makata, E. O. (2015). Health information: An important instrument to both the living and the dead. Abuja: Solid Rock Press.
14. Murdoch, T. B., & Detsky, A. S. (2013). The inevitable application of big data to health care. *JAMA, 309*(13), 1351-1352.
15. Obermeyer, Z., & Emanuel, E. J. (2016). Predicting the future—big data, machine learning, and clinical medicine. *The New England Journal of Medicine, 375*(13), 1216-1219.
16. Olaniyan, A. O. (2015). Impact of diseases surveillance and notification system on diseases control strategies in Ife-North Local Government area of Osun-State: A project submitted to College of Health Sciences, Hondegbe North American University, Cotonoun, Benin Republic.
17. Omole, S. M. (2017). Influence of patient records management practices, disease surveillance and notification systems on epidemic control in Osun State, Nigeria (PhD thesis). Department of IRM, Babcock University, Ilishan-Remo, Ogun-State, Nigeria
18. Osundina, F. S. (2014). Management of medical records for health care delivery in University College Hospital, Ibadan. *Information Impact: Journal of Information and Knowledge Management, 5*(1), 71-83.
19. Raghupathi, W., & Raghupathi, V. (2014). Big data analytics in healthcare: Promise and potential. *Health Information Science and Systems, 2*(1), 1-10.
20. Sun, J., & Reddy, C. K. (2013). Big data analytics for healthcare. *Proceedings of the 19th ACM SIGKDD international conference on Knowledge discovery and data mining*, 1525-1525.

21. Vest, J. R., & Gamm, L. D. (2010). Health information exchange: Persistent challenges and new strategies. *Journal of the American Medical Informatics Association*, *17*(3), 288-294.
22. Wang, Y., Kung, L., & Byrd, T. A. (2018). Big data analytics: Understanding its capabilities and potential benefits for healthcare organizations. *Technological Forecasting and Social Change*, *126*, 3-13.
23. Weiskopf, N. G., & Weng, C. (2013). Methods and dimensions of electronic health record data quality assessment: Enabling reuse for clinical research. *Journal of the American Medical Informatics Association*, *20*(1), 144-151.