



Research Paper

# ICT use and Service Delivery of Health Information Management Professionals in Federal University Teaching Hospitals in North-West, Nigeria

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## ABSTRACT

The effective delivery of healthcare services, especially in federal university teaching hospitals, is crucial for ensuring the best possible patient care and results. Despite efforts to improve the performance of health information management professionals in these institutions, there has been a noticeable decrease in service quality. This decline may be due to various factors, including the insufficient use of Information and Communication Technology (ICT). The underutilization of ICT tools hinders the ability of health information management professionals to efficiently handle patient data, streamline administrative processes, and facilitate communication among healthcare providers. Hence, this study ICT use and service delivery of health information management professionals in federal university teaching hospitals in North-West, Nigeria. The study adopted the survey research design, which allowed the researchers to gather data from health information management professionals efficiently. The population comprised 350 health information management workers of the three federal teaching hospitals and 422 out-patients. Considering the size of the population of the study, total enumeration was employed to cover the entire population in North-West geopolitical zone of Nigeria, while Krejcie and Morgan formula was used to determine a sample of the out-patients. A validated questionnaire was used to collect data. Data were analyzed using descriptive and inferential (multiple linear regression analysis) at 5% significance level. The results revealed that ICT use has no significant influence on service delivery by health information management professionals in federal university teaching hospitals in North-West, Nigeria ( $R^2 = 0.000$ ,  $\beta = -0.006$ ,  $t(348) = -0.108$ ,  $p > 0.05$ ). The study concluded that ICT use has no significant effect on service delivery of health information management professionals in federal university teaching hospitals in North-West, Nigeria. Therefore, the study recommended that management of federal university teaching hospitals should implement comprehensive training programs aimed at enhancing HIM professionals' proficiency in utilizing ICT tools effectively. These programs should focus not only on technical skills but also on understanding how ICT can optimize service delivery processes.

**Keywords:** Health information management, Information and Communication Technology, Service delivery

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## I. Introduction

Service delivery in healthcare, particularly in federal university teaching hospitals, plays a crucial role in ensuring optimal patient care and outcomes. Hence, efforts have been directed towards enhancing the service delivery of health information management professionals within these institutions, aiming to streamline processes, improve efficiency, and ultimately enhance patient care (Usak et al., 2020). However, despite these efforts, there has been a noticeable decline in service delivery, which could be attributed to various factors, including inadequate utilization of Information and Communication Technology (ICT). The underutilization of ICT resources hampers the ability of health information management professionals to effectively manage patient data, streamline administrative tasks, and facilitate communication among healthcare providers (Addo & Agyepong, 2020). Hence, there is a pressing need to thoroughly examine the impact of ICT utilization on the service delivery of health information management professionals in federal university teaching hospitals, particularly in the North-West region of Nigeria. Omotosho et al. (2019) opined that understanding the challenges and potential solutions related to ICT use in healthcare settings is paramount to improving service delivery and ultimately enhancing patient care outcomes in these institutions.

Globally, the importance of effective service delivery in healthcare cannot be overstated, as it directly impacts patient outcomes, public health, and overall well-being. Efforts have been made worldwide to enhance service delivery across various healthcare systems, with a focus on improving access, quality, and efficiency of care (Ogolodom et al., 20203). However, despite these efforts, challenges persist, including disparities in access to healthcare services, resource constraints, and technological limitations. In many regions, including sub-Saharan Africa, South Asia, and parts of Latin America, inadequate infrastructure and workforce shortages further exacerbate these challenges. Moreover, the COVID-19 pandemic has highlighted the importance of resilient healthcare systems capable of responding to crises while maintaining essential services. In this context, leveraging Information and Communication Technology (ICT) holds significant promise for improving service delivery by enabling remote consultations, digital health records, and data-driven decision-making (Taylor et al., 2020). Yet, realizing the full potential of ICT requires addressing barriers such as digital literacy, infrastructure gaps, and privacy concerns. Therefore, a concerted effort is needed at the global level to harness technology effectively, strengthen healthcare systems, and ensure equitable access to high-quality care for all (Dinbabo et al., 2018).

Healthcare service delivery in Africa, and particularly in Nigeria, faces numerous challenges that significantly impact the quality and accessibility of healthcare for the population (Lalla-Edward et al., 2022). Adedokun and Uthman (2019) argued that in many African countries, including Nigeria, healthcare systems grapple with inadequate infrastructure, shortages of medical personnel, and insufficient funding. These issues contribute to disparities in healthcare access between urban and rural areas, with rural populations often bearing the brunt of inadequate services. Additionally, political instability, corruption, and weak governance further exacerbate these challenges, hindering effective healthcare delivery (Oleribe et al., 2020). As a result, many Africans struggle to access essential healthcare services, leading to increased morbidity and mortality rates, particularly for preventable and treatable diseases (Maphumulo & Bhengu, 2019).

In Nigeria specifically, healthcare service delivery is marred by various systemic problems, including overcrowded facilities, a shortage of medical supplies, and insufficient healthcare personnel (Ephraim-Emmanuel et al., 2018). Long wait times, coupled with inadequate patient record-keeping systems, contribute to patient dissatisfaction and hinder the effective management of healthcare facilities (Otu, 2018). Furthermore, the country faces significant public health challenges, such as infectious diseases, maternal and child health issues, and a growing burden of non-communicable diseases. Despite efforts to improve healthcare infrastructure and services, including initiatives to increase access to primary healthcare, Nigeria continues to struggle with delivering quality healthcare to its population, particularly in remote and underserved regions (Ekenna et al., 2020). Addressing these challenges requires comprehensive reforms, increased investment in healthcare infrastructure and personnel, and a focus on preventive and primary care services to ensure equitable access to quality healthcare for all Nigerians.

Service delivery may be best measured from the receiving end, that is, from the service recipients (Awofeso, 2018). For instance, service delivery in the health sector is a patient-centered healthcare system that reflects on how patients are provided with resources and access to medications and quality hospital care, and how well patients could interact with the system (Bergquista et al. 2020). Therefore, in healthcare facilities, service delivery refers to the outcome of various healthcare professionals' jobs, actions, or activities intended at minimizing patient's discomfort, preventing or curing sickness, reducing morbidity and mortality, improving patient happiness, and guaranteeing a healthy population. Service delivery has to do with getting services effectively as quickly as possible to the intended recipient and this reflects the degree of excellence on the part of the organization (Karnja & Juma, 2020). Therefore, strengthening of service delivery is crucial to the achievement of the provision of interventions and in reducing health issues that threaten the lives of people. The manner in which a patient's services are provided will impact the outcome of his/her care. Some affluent countries, like the United States of America, the United Kingdom and Switzerland have made significant improvements in health-care delivery (American Medical Association, 2014). Healthcare service delivery is critical for promoting health, avoiding disease, and improving economic performance in any country, and it is essential for the country's long-term prosperity and general well-being.

The World Health Organization (2008) defines healthcare service delivery as the provision of accessible, available, and comprehensive healthcare services tailored to individual health needs. Prakoso et al. (2017) also emphasize that service delivery encompasses various aspects of service quality, including reliability, responsiveness, assurance, empathy, and tangibility. However, this study primarily adopts Parasuraman et al.'s (1988) service delivery indices, which consist of tangibility, responsiveness, reliability, assurance, and empathy. The first aspect, tangibility, pertains to the physical appearance of equipment and structures used in service delivery. In this research, tangibility specifically relates to the availability and accessibility of these physical facilities for providing services. This includes not only the presence of service providers like health information professionals but also the materials, storage facilities, and other resources necessary to facilitate their services (Ojo & Owolabi, 2017).

The study examines various indicators of healthcare service delivery, including responsiveness, reliability, assurance, and empathy. Responsiveness entails the promptness and sympathy of healthcare professionals in attending to patients' needs. Reliability emphasizes the consistent, accurate, and evidence-based delivery of services by healthcare providers. Assurance focuses on instilling confidence and trust in patients through the competence and credibility of healthcare professionals. Empathy involves showing compassion, listening to patients, and involving them in decision-making regarding their healthcare. However, despite the critical role of health information management (HIM) professionals in service delivery, challenges such as delays in retrieving patient records, high waiting times, and inadequate filing space persist. These challenges contribute to dissatisfaction among patients and hinder quality healthcare service delivery. Thus, there is a need to explore the potential impact of information and communication technology (ICT) use and staff training on improving HIM professionals' service delivery. (Asogwa et al., 2014; Alshammary, 2017; Isaruk et al., 2021; Adeleke & Erinle, 2015; Omisore & Agbabiaka, 2016; Peter et al., 2020; Salihu & Ikonne, 2022).

Information and Communication Technology (ICT) plays a pivotal role in enhancing healthcare service delivery by facilitating efficient communication, improving access to medical information, and streamlining administrative processes (Cook et al., 2018). Aceto et al. (2018) submitted that ICT enables healthcare providers to access patient records remotely, ensuring continuity of care and reducing the risk of medical errors. Telemedicine platforms leverage ICT to connect patients with healthcare professionals, particularly in underserved areas, expanding access to medical expertise and reducing the need for physical consultations. Moreover, ICT tools such as electronic health records (EHRs) centralize patient data, enabling healthcare providers to make informed decisions and deliver personalized care (Alam et al., 2018). Additionally, ICT enhances healthcare management through the automation of administrative tasks, optimizing resource allocation, and reducing operational costs. By leveraging ICT solutions, healthcare systems can enhance efficiency, improve patient outcomes, and ultimately contribute to the delivery of quality healthcare services to individuals and communities (Zonneveld et al., 2020).

Efficient service delivery is crucial for the effectiveness of any nation's healthcare system, ensuring the provision of a range of health services tailored to meet the diverse needs of residents, including preventive, curative, palliative, rehabilitative, and health promotion services. However, the service delivery of health information management professionals in tertiary hospitals across Nigeria has been observed to be inadequate or subpar. For instance, Bronsoler, et al. (2022) and Ephraim-Emmanuel et al. (2018) highlighted the poor state of healthcare service delivery in the country. Challenges such as insufficient filing space for patient records, as identified by Salihu and Ikonne (2022), and the influx of non-professionals into health information management departments, as noted by Peter et al. (2020), further compound the issue. Additionally, studies by Adeleke and Erinle (2015) and Omisore and Agbabiaka (2016) revealed patient dissatisfaction due to persistent delays in retrieving case files, long waiting times for registration, and issues with unavailable, inaccurate, lost, mutilated, or misplaced patient records. While these factors contribute to the low rate of service delivery by health information management professionals, other factors such as the utilization of information and communication technology (ICT) and staff training may also play significant roles.

## **II. Literature Review**

The literature review gives the conceptual, empirical and theoretical foundation for the study. It presents the conceptual framework for the study by exploring the relevant key literature to the concepts of service delivery of health information management professionals and ICT use

### **2.1 Service Delivery**

According to Indeed Career Guide (2023), service delivery refers to the delivery of a service from a business to a customer. The service a business provides is something that the customer is unable to perform themselves. Good service delivery encompasses all aspects of providing a service to a customer, including the initial interaction, on boarding, set up, conclusion of the service and follow-up provisions. Hailay (2019) posits that service delivery may be referred to a situation whereby a product or service meets the needs of a user or can be applied by a user. Service delivery in a health organization is said to be a product of the governance, financing and resource generation functions whether at public, primary or specialist care sub-function and depends heavily on the governance mechanisms guiding the planning and operation of services (Bloom & Nolte, 2019). WHO (2010) asserted that service delivery impacts directly on the intermediate objectives of effectiveness, safety and user experience, along with efficiency and equity of service delivery, and access. Service delivery in health organizations in a general sense implies a situation whereby patients receive the treatment and supplies they are entitled to from across different units within the system, including accurate and timely health information management (Akinboade et al. 2012).

Service delivery in the health sector is seen as the cornerstone upon which every health institution is built. Workers in all health institutions are aware that the population they serve depends on their services for

optimal experiences in preventive, diagnostic, therapeutic and rehabilitative measures that help them stay fit (Kalantari et al., 2021). How services are delivered in healthcare systems as part of its core function therefore, directly impacts intermediate health system objectives and, ultimately, the achievement of overarching health system goals. According to the World Health Organization (WHO, 2010) framework of health system building blocks, health service delivery is considered to function well when equitable access to a comprehensive range of high-quality health services is ensured within an integrated and person-centered continuum of care. To ensure a person-centered continuum of care, health information management professionals as the beginning point of call within every health care set-up are expected to deliver stand-out services that enable other healthcare workers deliver optimal services to clients (Sunkel & Sartor, 2022).

## **2.2 Information and communication Technology (ICT) Use**

Information and Communication Technology (ICT) use has become ubiquitous in contemporary society, permeating nearly every aspect of daily life. From personal communication to business operations, education, healthcare, and governance, ICT plays a pivotal role in facilitating connectivity, efficiency, and innovation (DuBrin, 2019). Through various digital tools and platforms such as smartphones, computers, the internet, and social media, individuals can access and exchange vast amounts of information instantaneously, transcending geographical boundaries. Additionally, ICT enhances collaboration and productivity in the workplace through cloud computing, project management software, and virtual communication tools (Mondy, et al. , 2022). Moreover, in sectors like education and healthcare, ICT enables personalized learning experiences and remote medical consultations, thereby democratizing access to knowledge and healthcare services. As society continues to evolve, the strategic integration of ICT will remain essential for driving progress, fostering inclusivity, and addressing complex challenges in the digital age (Bartol & Martin, 2021).

Appiah-Otoo et al. (2023) opined that the application of ICT in information management in health organizations is the intersection of information science, computer science, information technology and healthcare. It deals with the resources, devices, and methods required in optimizing the acquisition, storage, retrieval, and use of information in health care and biomedicine. This includes not only computers but also clinical guidelines, formal medical terminologies, and information and communication systems (Hailegebreal et al, 2022). Research and development efforts within the healthcare industry and the rapid advancement in ICT over the last two decades have brought about significant advances in the quality of medical services to the patients. Challenges facing information and communication technology applications in hospitals include the following; digital divide, security issues, lack of information control, safety, and cost of service delivery to the patients (Villamanan & Alvarez-Sala, 2019).

## **2.3 Theoretical Framework**

The underpinning theory for this study is the service quality model. The service quality model or SERVQUAL model of service quality was developed and implemented by the American marketing gurus Valarie Zeithaml, A. Parasuraman and Leonard Berry in 1988. It is a method used to capture and measure the service quality experienced by customers. Before then, they had initially proposed a conceptual framework for service quality in 1985. The model was based on the interpretation of qualitative data from extensive exploratory research (focus groups and in-depth executive interviews) performed in several service businesses such as retail banks, a long distance telephone company, securities broker, repair and maintenance firm and credit card company. They identified four distinct gaps on the service provider's side that potentially affect customer perception of service quality (Cook & Verma, 2012). Applying the SERVQUAL theory to service delivery of health information management professionals in tertiary hospitals is basically in the area of customer expectation and whether service providers understands such expectation and the extent to which they are willing to go in order to ensure that hospital clients gets the best service delivery possible. As is traditional with most service oriented organizations in the country, the customer is rarely the focus due to lack of appropriate management processes, market analysis tools and attitude (AIOmari, 2021). As seen from the analysis of the theory, having guidelines for service delivery is not enough unless those guidelines are strictly adhered to by those implementing them. Ideally, health organizations' primary concern should be the people they serve. This singular goal should permeate the activities of all workers in such institutions including health information management professionals within health organizations. Where service delivery is not at its best, customers are left unsatisfied and organizational goals are unattained (Sibai et al., 2021).

## **2.4 Empirical Review**

Aimuan and Aigbe (2019) examined the application of information and communication technology (ICT) in revitalizing public service delivery in the Nigerian public sector. Primary and secondary data were used with 100 patients of the hospital and twenty I.T. The study found that ICTs remain a veritable instrument for enhancing public service delivery in Nigeria, besides ICTs have the great potentials to enhancing profits while retaining quality, time-saving and access; advancing efficiency and effectiveness while bringing about social and

economic development. They however, posited that ICTs potentials for service delivery in the public sector are hampered by many obstacles, such as poor leadership commitment, low ICTs literacy and usage; the problem of digital divide, Nigeria's epileptic power supply, lack of trust on e-governance and so on. Similarly, Soi (2017) researched information and communication technology (ICT) and service delivery in Teachers Service Commission, Kenya. The study adopted a longitudinal case study design and found that that the commission endeavour to achieve competitive advantage over their competitors in such a dynamic environment by using ICT to render services to the public. The study noted that there are an increasing number of contexts in which information technology is being used to support or replace the human service agent in service delivery. This development is taking place against a background of growing technological sophistication, global market places and communities, and an ever increasing significance of service products in national and international economies.

In health organizations, Onadipe et al. (2013) investigated ICT use and health workers proficiency as a determinant of health information management in Ogun state health facilities. The study adopted survey method with 450 respondents. They discovered that although the use of ICT for health information management (data/records management and medical diagnosis) is relatively low in the state's health facilities, the proficiency level of health professionals in few facilities where ICT is in use was high and service delivery was also better. Likewise, Busayo, et al. (2022) researched on the use of information and communication technology (ICT) among primary health care workers in Ekiti State, Nigeria. The study was a descriptive study with 301 respondents. They found also that service delivery of primary healthcare workers in state facilities was enhanced through the use of ICT. In their study of information and communication technology (ICT) applications and use in medical records and information management in selected hospitals in Ijebu Ode Local Government Area, Ogun State, Ogungbade and Abdul (2022); using a survey research method, discovered that computers, software like Microsoft word and Excel, surgical ICT tools, internet, management software, infection detecting technologies, health information system programme (HISP), ultrasound imaging devices, telemedicine, national health care management information system (NHC/MIS) and scanners were in use in many health organizations studied. Service delivery of personnel was found to be high, though more training, awareness, exposure or workshops for staff in the hospital on the application and use of ICT tools which are seldom or never used in the hospitals to improve the health care services rendered in the hospitals was recommended.

### III. Methodology

The study adopted the survey research design, which allowed the researchers to gather data from health information management professionals efficiently. Preliminary investigation by the researcher revealed that a total of 350 health information management workers constitute the workforce of the three (3) federal teaching hospitals under this study. Considering the size of the population of the study, total enumeration was employed to cover the entire population in North-West geopolitical zone of Nigeria. Also, Krejcie and Morgan formula was used to determine a sample of 422 out-patients after the addition of 10% attrition rate. A validated questionnaire was used to collect data. Data were analyzed using descriptive and inferential (multiple linear regression analysis) with the aid SPSS statistical software version 25.

### IV. Data Analysis, Results and Discussion

Three hundred and fifty (350) copies of the questionnaire were retrieved from the HIM professionals while four hundred and twenty-two (422) were retrieved from the out-patients. The collected data were analyzed using both descriptive and inferential statistics. Descriptive statistics such as frequency counts, and percentages were used to analyze demographic data while frequency counts, percentages, mean scores, and standard deviation was used to analyze research questions. Linear regression was used to test hypotheses.

#### 4.1 Restatement of Research Hypothesis

**H<sub>01</sub>:** ICT use has no significant influence on service delivery by health information management professionals in federal university teaching hospitals in North-West, Nigeria

**Table 4.1: Simple linear regression analysis of level of ICT use and service delivery**

Predictors	B	Std. Error	Beta (β)	T	P	R <sup>2</sup>	Adj. R <sup>2</sup>	F	ANOVA (Sig.)
(Constant)	3.533	0.062		56.597	.000	0.000	-0.003	0.012	0.914
Level of ICT Use	-.003	0.024	-0.006	-0.108	.914				
Dependent Variable: Service Delivery Predictor: (Constant), Level of ICT Use DF (F-Statistic) = 1, 349 DF (T-Statistic) = 348									

**Source: Field Survey Results, 2023**

### **Interpretation**

#### *Estimated model*

The model for the regression output is estimated as:

$$SD = \beta_0 + \beta_1 ICT + \mu$$

Where SD=Service delivery, CT=ICT use and  $\mu$  = error term

The results presented in Table 4.1 show that ICT use has no significant influence on service delivery of HIM professionals in federal university teaching hospitals in North-West, Nigeria ( $R^2 = 0.000$ ,  $\beta = -0.006$ ,  $t(348) = -0.108$ ,  $p > 0.05$ ). The regression output revealed that ICT use predictor variable is not significant because  $p > 0.05$ . The result further shows that ICT use did not explain any variation in service delivery of HIM professionals in federal university teaching hospitals in North-West, Nigeria. Therefore, the null hypothesis ( $H_0$ ) which states that ICT use has no significant influence on service delivery of HIM professionals in federal university teaching hospitals in North-West, Nigeria was accepted. This implies that the level of ICT use of HIM professionals cannot determine their service delivery.

## **V. Discussion of Findings**

The result of the hypothesis from the linear regression analysis revealed that ICT use had no significant influence on service delivery of HIM professionals in federal university teaching hospitals in North-West, Nigeria. This finding is in disagreement with earlier studies of Busayo et al. (2022), Essien et al. (2022), Ogungbade and Abdul (2022), who all revealed that ICT use significantly influenced service delivery. Busayo, Olajide, Fagbuaro and Ajeyomi (2022) found that the Use of ICT was low despite that service delivery of primary healthcare workers in state facilities was enhanced through the use of ICT. Also, Essien, Lu, Abredu and Zotoo (2022) found that while the goal of information communication technology (ICT) use in any organization is to improve the quality of service delivery to stakeholders in diverse ways, some negative effects of ICT in organizations have been noted. These include Job loss, high cost of equipment, transparency, accountability, loss of interpersonal communication, technical difficulties, illiteracy, leakage of personal information, software errors and the continuous evolving nature of technological trends. Moreso, in Ogungbade and Abdul (2022), service delivery of personnel was found to be high, though more training, awareness, exposure or workshops for staff in the hospital on the application and use of ICT tools which are seldom or never used in the hospitals to improve the health care services rendered in the hospitals was recommended.

## **VI. Conclusion and Recommendations**

In conclusion, the findings of this study implies that the extent of Information and Communication Technology (ICT) utilization by Health Information Management (HIM) professionals within hospitals does not serve as a dependable indicator for forecasting their service delivery. Despite the integration of ICT into their workflows, HIM professionals' performance and service provision appear to be unaffected by the level of ICT usage. This suggests that factors beyond technology adoption may significantly influence the effectiveness of HIM professionals in delivering their services within hospital settings. Therefore, a comprehensive understanding of these additional factors is essential for enhancing service delivery outcomes in healthcare institutions.

Given the non-significant relationship between ICT use and service delivery among HIM professionals, it's imperative for federal university teaching hospitals in North-West Nigeria to reassess their ICT integration strategies and practices. While ICT tools and systems are essential for modern healthcare delivery, their mere presence may not suffice to enhance service delivery without proper utilization and integration into workflow processes. Hence, the study recommended that management of federal university teaching hospitals should implement comprehensive training programs aimed at enhancing HIM professionals' proficiency in utilizing ICT tools effectively. These programs should focus not only on technical skills but also on understanding how ICT can optimize service delivery processes.

### **Suggestion for Further Study**

For further study, it would be beneficial to investigate the specific factors that influence service delivery effectiveness among HIM professionals in federal university teaching hospitals in North-West Nigeria. This could involve conducting qualitative research such as interviews or focus groups with HIM professionals, hospital administrators, and other stakeholders to gain a deeper understanding of the challenges and barriers they face in delivering high-quality services. Additionally, exploring the perceptions and experiences of patients receiving services from these professionals could provide valuable insights into areas for improvement.

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